
Mr. Joseph Knight.

51257/B

B seq.
THOMSON, S.

013733

S
35
Med

TEMPERANCE

AND

TOTAL ABSTINENCE.

TEMPERANCE

AND

TOTAL ABSTINENCE,

OR

THE USE AND ABUSE OF ALCOHOLIC LIQUORS

IN

HEALTH AND DISEASE.

BY

SPENCER THOMSON, M.D., L.R.C.S.E., ETC.

" Quot homines, tot sententiæ."



LONDON:

JOHN CHURCHILL, PRINCES STREET, SOHO.

MDCCCL.

34831 1



C. AND J. ADLARD, PRINTERS, BARTHOLOMEW CLOSE.

TO

WILLIAM WOOD, Esq.,

LATE PRESIDENT OF THE ROYAL COLLEGE OF SURGEONS
OF EDINBURGH,

THE FOLLOWING VOLUME IS

Dedicated,

IN GRATEFUL REMEMBRANCE OF PAST KINDNESS.

HISTORY

OF

THE TEMPERANCE PRIZE.

Early in the year 1848, advertisements appeared offering a Prize of One Hundred Guineas for the best Essay on the "Use and Abuse of Alcoholic Liquors in Health and Disease;" the competing Essays to be sent in on or before January 1st, 1849. Just before the above date expired, advertisements again appeared, postponing the period for receiving the Essays until October 1st, 1849; and stating, that the adjudicators had advised this step, as they considered that sufficient publicity had not been given to the offer. In course of time the author received a private communication, of which the substance is contained in the following—

Copy of the Adjudicators' Report.

"From the fifteen MS. Essays on the 'Use and Abuse of Alcoholic Liquors,' transmitted to us by Messrs. Beggs and Gilpin for adjudication, we have unanimously selected, as the best, the one bearing the motto 'Mens sana in corpore sano.' We accordingly adjudicate to its author* Mr. Eaton's prize of One Hundred Guineas.

* Dr. W. B. Carpenter.

"We also think it due to the author* of the Essay, bearing the motto 'Quot homines, tot sententiæ,' to record our opinion of its great merits, and to express our belief that the cause of temperance would be benefited by its publication.

"We further deem it right to speak in terms of commendation of the Essay bearing five mottos, the first of which is 'How use doth breed a habit in a man.'

"(Signed) JOHN FORBES, M.D.
G. L. ROUPELL, M.D.
WILLIAM A. GUY, M.B."

"*Dec. 6th,* 1849."

* Dr. Spencer Thomson.

ONE HUNDRED GUINEAS PRIZE ESSAY.

A Prize *of* One Hundred Guineas *will be given for the best Essay on the Use of Alcoholic Liquors in Health and Disease.*

The Essay must contain answers to the following questions:—

1st.—What are the effects, corporeal and mental, of Alcoholic Liquors on the healthy human system?

2d.—Does physiology or experience teach us, that Alcoholic Liquors should form part of the ordinary sustenance of man, particularly under circumstances of exposure to severe labour or to extremes of temperature? Or, on the other hand, is there reason for believing that such use of them is not sanctioned by the principles of science, or the results of practical observation?

3d.—Are there any special modification of the bodily or mental condition of man, short of actual disease, in which the occasional or habitual use of Alcoholic Liquors may be necessary or beneficial?

4th.—Is the employment of Alcoholic Liquors necessary in the practice of Medicine? If so, in what diseases, or in what form and stages of disease, is the use of them necessary or beneficial.

1. Each Essay must be accompanied by a sealed envelope, containing the real name and address of the author, and superscribed with a name or motto, similar to that attached to the Essay; only the envelope of the successful Candidate to be opened by the Adjudicators.

2. It is desired (but this is not an essential point) that the Essay should not extend beyond 250, nor fall short of 120, pages of print of medium size octavo.

3. The Essay must be written in a clear, legible hand, on one side of the page only; and must be delivered to the undersigned address, on or before the 31st day of December, 1848.

4. The successful Essay will remain the property of the Donor of the Prize, and will be published.

Dr. John Forbes, f.r.s., Physician to the Queen's Household, Prince Albert, and the Duke of Cambridge; Dr. G. L. Roupell, f.r.s., Physician to St. Bartholomew's Hospital; Dr. W. A. Guy, m.b., Cantab., Professor of Forensic Medicine, King's College, London, have kindly consented to act as Adjudicators.

Signed on behalf of the Donor, { Charles Gilpin, Thomas Beggs.

London, 5, *Bishopsgate Street Without*;
April, 1848.

PREFATORY NOTICE.

THE author of the following Essay—which is published in accordance with the expressed opinion of the adjudicators—although not coming before the public with the prestige of the successful competitor, has at least the satisfaction of being second to one so worthy of his well-earned reputation as Dr. W. B. Carpenter. If some of the latest facts connected with the subject under discussion are unnoticed in the following pages, it is in some degree owing to the circumstance that the Essay was prepared and sent in at the period first fixed upon for the reception of the manuscripts; and that it is somewhat irksome, and not always possible, without much inconvenience, — amid the engagements and anxieties of a country general practice,—to make additions to a work already regarded as out of hand and completed.

Haunton; Clifton Campville, Burton-on-Trent;
Feb. 22, 1850.

PREFACE.

In the researches of modern physiology, in the recent discoveries and generally received theories of animal chemistry, in the records of medical science, and in the evidence of well-authenticated fact derived from extraneous sources of information, we possess material so abundant and so valuable from which to select proofs and form deductions bearing upon the subject of the following Essay, that the aim of the Author has been, rather to collect, arrange, and build up, and if possible to place in new light, the scattered and somewhat neglected materials already hewn out by the skilled and well approved labour of others, than to quarry out for himself a few facts which might lay some claim to originality, but which could have but small weight in the consideration of a question so widely interwoven as the one before us.

The writer is well aware that many of the arguments he has used, and of the conclusions he has arrived at, are such as will not satisfy the extreme advocates of the Teetotal or Total-Abstinence system; but as truth, and not the carrying out of any fixed prejudices or sectarian principles, has been his object, his endeavour has also been to preserve the straight line of candid unbiassed investigation.

It may appear to many, that the tone of the Essay is often rather one of defence than of discussion; this, however, is unavoidable; the position assumed by many of the zealous advocates of total abstinence, is such, that it forces even those who agree with them in the main, to adopt what appears a defensive style of reasoning when discussing points of the question on which a difference of opinion exists. Those doctrines which denounce alcohol and alcoholic liquors in any form, as poisons unsuitable and hurtful to man at all times and under all circumstances, are certainly not supported, either by general reasonable experience, or by chemical, physiological, or medical science; neither are they likely to win the assent of the more intelligent portion of the community generally, and certainly not of the

great body of medical men, who daily meet with facts which contradict the assertions of the enthusiastic supporters of the cause. At the same time, whilst few belonging to the medical profession will be found to give their adherence to the ultra doctrines of total abstinence, no class of the community can be so practically alive to the terrible evils inflicted on mankind by the abuse of alcoholic stimuli, and none ought more sedulously to guard against all that can encourage that abuse or unnecessary employment. There is no doubt that these liquors have been and are often prescribed far too laxly and unscientifically, and that the temperance movement has been of much service—*inter alia*—in attracting the attention both of the profession and of the public to the question, and will thus, undoubtedly, check the evil. But, as generally happens, from one extreme we are in danger of running into another; and enthusiastic men, some of them possessing high medical attainments, by advocating the total abandonment of alcohol even in the treatment of disease, and under all circumstances, are incurring a risk, not only of injuring the efficiency of practical medicine, but of damaging a good cause. The endeavour of the author has been, by scientific demonstration, to mark the line

between the empirical abuse, and the rational application of one of God's gifts to man, placed in his power not for evil but for good.

In order fully to illustrate the bearing and point of the Essay, it has been necessary to introduce a first chapter on the subject of stimuli generally, not, it is true, directly connected with the subject, but so indirectly illustrating the consideration and treatment of it, as to render its omission impossible.

CONTENTS.

CHAPTER I.

STIMULI GENERALLY.

INTRODUCTORY.

PAGE

Definition of Stimulation—Division of Stimuli—Ordinary Stimuli—Classification, Physical, Mental—Heat, a Stimulant—Light, a Stimulant—Electricity—Air and Aliment—Ordinary Mental Stimuli—Extraordinary or occasional Stimuli—Classification, Physical, Mixed, Mental—Sexual Feelings—Dancing—Athletic Exercises — Travelling — Joy — Hope — Love — Anger — Social Intercourse—Politics—Music—Eloquence—Remarks — Superfluous Stimuli—Proposition deduced. 1

CHAPTER II.

ALCOHOL AND ALCOHOLIC FLUIDS—THEIR NATURE, ETC.

Alcohol—Its Nature and Properties—History—Mode of Formation—Fermentation — Conditions necessary for—Grape-Sugar—Classification of Alcoholic Liquors—Fermented Liquors—Grape-Juice, its tendency to ferment—Palm-Juice—Ancient use of Wine—Classification of Fermented Liquors—Grape Wines—Classification, Characters, Proportion of Spirit—Unfermented Grape Wines—Home-made Wines of Britain, their Defects—Cider and Perry—Malt Liquors, History, Characters—Distilled Spirits, Varieties. . . . 12

CHAPTER III.

Action of Alcohol on Dead Matter—On Living Surfaces—External, Cooling Effects, Irritant — Internal, Alimentary Canal — Influence of Habit — Poisonous Doses—Cases—Diluted Doses—Observations of Dr. Beaumont, Remarks on—Action on Serous Membranes. 27

CHAPTER IV.

ALCOHOL, ITS EFFECTS ON THE NERVOUS, CIRCULATING, AND MUSCULAR SYSTEMS.

PAGE

Primary Effects on the Nervous Extremities and Masses, M. Ségalas, Andral—Circulating System—Absorption, Proofs of rapid, Dr. Percy, Magendie, MM. Bouchardat and Sandras—Affinity for certain Textures, Dr. Budd—Effect on Blood, M. Ségalas, Dr. Percy, Dr. Peters—Remarks, Dr. Prout, —Liebig—Effects on Nervous System, Directly on Brain—Cases, Dr. Percy, Dr. Forbes, Dr. Wilson Philip—Remarks—Iris affected, Mr. Bedingfield—Effects on Muscular System, Diminished change of Tissue, Influence of External circumstances—Muscular Exertion, Dr. Guy—Nervous excitement—Diffusion through Body, Breschet—Effect in Retarding Development. . 36

CHAPTER V.

ALCOHOL, ITS EFFECTS ON THE DIGESTIVE AND URINARY ORGANS, LUNGS AND SKIN, AND IN POISONOUS DOSES.

Alcoholic Fluids — Their Digestion, Dr. Paris, Orfila, Remarks — Coagulating Power — Injurious Effects on the Digestive Organs, Stomach, Liver, Dr. Budd, Andral, Dr. Prout—Effect of Heat, Dr. Parkes—Pancreas—Kidneys, Excretion, Liebig, &c., Dr. Percy—Bright's Disease, Dr. Christison, Dr. Prout—Respiratory Organs—Excretion of Carbon, MM. Bouchardat and Sandras—Excretion of Alcohol—Luminous Breath — Diseases, Dr. Guy, Dr. Mackintosh, Sir J. Clark—Skin—Poisonous Doses—Sudden Death—Coma, Dr. G. Bird; Duration—Pathology—Slow Poisoning—Offspring of Drunkards, Burton, Dr. Darwin, &c.—Value of Temperance. . . . 56

CHAPTER VI.

CORPOREAL EFFECTS OF VARIOUS MODIFICATIONS OF ALCOHOLIC LIQUORS.

Spirits of Wine, Difference in Action, &c., Dr. Paris, Donovan, Fabroni—Feather-white Wine, Liebig—Sparkling Wines—Light Wines—Strong Wines—Acids in Wine—British Wines—Malt Liquors—Lithic Acid. 73

CHAPTER VII.

MENTAL EFFECTS OF ALCOHOL.

Brain and Mind — Sympathy—Alcohol, Effect on Mental Manifestations, Dr. A. T. Thomson, M'Neish—Phenomena of Intoxication—Consequences—Temperament — Temporary Insanity—Incitement to Crime, M. Quetelet, Eminent Judges—Permanent Insanity, Dr. Robinson—Statistics, Dr. Joseph Williams — Dipso-Mania, Sir A. Morrison — Withdrawal of Stimulant, Caution. 80

CHAPTER VIII.

ORDINARY USE OF ALCOHOL UNDER PECULIAR CONDITIONS OR CIRCUMSTANCES?

PAGE

Recapitulation—Purely Stimulant Action—Chemico-Vital Action—Direct Action —Irritation and Depression—Oxydation in System—The Question, Its consideration—Water-Drinkers — Health — Strength—Endurance—Alcohol in Health, Dr. A. Combe—Ardent Spirits — Fermented Liquors — Ordinary Labour—Severe Labour — Unnecessary Stimulation, Liebig—Alcohol and Muscular Force—Out-door Labour—Indispensable Exertion—Exhaustion, Major Forbes—Anecdote, Mr. Inglis—In-door Labour, Dr. Latham, Dr. Guy, Dr. Robinson—Imperfect Hygiene—Extraordinary Exertion, Dr. Carpenter —Continued Exertion—Deficient Sleep—Remarks—Sudden Efforts—Mental Labour — Natural Stimuli — Alcohol, Dr. Patterson — Hot Climates, Dr. Carpenter, Dr. Copland, Liebig—Remarks—Aromatics—Cold Climates—Fats and Oils, Dr. Richardson—Moist Cold, Mr. Morris—Travelling. . . . 90

CHAPTER IX.

USE OF ALCOHOL UNDER SPECIAL CONDITIONS OF BODY OR MIND?

Question considered—Ailments — Depression, Causes, Dr. S. Smith—Subject Divided—Constitutional Depression, Description, Cases, Remarks—Super-Secretion, Sexual, Lacteal, Case, Dr. Carpenter, &c.—Depression after Illness, Remarks—Depression from Withdrawal, Remarks—Constitution, Mr. Corfe —Dangers, Cases, Substitutes, Dr. A. Combe—Age, M'Neish — Mental Depression, Remarks—Dyspepsia. 114

CHAPTER X.

ALCOHOLIC LIQUORS, THEIR EMPLOYMENT IN MEDICAL PRACTICE

Question considered—Subject Divided—Acute Disease—Fever, Dr. S. Smith, Dr. Tweedie, Dr. G. Gregory—Softened Heart, Dr. C. J. B. Williams, Dr. Corrigan, Dr. Latham — Chemico-Vital Effects, Dr. Carpenter — Exanthemata — Erysipelas, Dr. Pearson, Dr. R. Williams, Abernethy— Delirium Tremens—Nervous Shock, Mr. Hennen—Hemorrhage, Uterine, &c.—Cholera, Asiatic, British—Thoracic Affection—Abdominal — Chronic Disease—Nervous—Spasm—Chorea, &c.—Thoracic—Phthisis, Sir J. Clark— Heart—Abdominal, Stomach, Dr. A. Combe, Dr. Prout, Dr. Paris—Atonic Dyspepsia, Dr. Gregory—Nervous Influence, Dr. Roget—Remarks—Natural Stimuli—Liver, Dr. Budd—Kidney, Dr. Prout, Dr. G. Bird—Diabetes, Dr. Prout, M. Bouchardat—Bright's Disease—Scrofula—Dropsy, Dr. Gregory— Scurvy, Dr. Christison, Dr. Lonsdale—Skin Disease—Recapitulation. . . 131

CHAPTER XI.

ALCOHOLIC LIQUORS, TEA, COFFEE, WATER, ETC.

PAGE

Water—Remarks—Varieties, Soft, Hard, Marsh—Tea and Coffee—Composition, Liebig—Theine, Caffeine—Advantages — Biliary Principles—Chemico-Vita. Effects, Stimulant—Green Tea, Effects, Poisonous, Mr. Corfe, Millingen—Black Tea, Dr. Paris—Coffee, Dr. Paris, Dr. A. Combe, Magendie, M. Payen, Dr. Prout—Remarks. 159

CHAPTER XII.

RECAPITULATION AND CONCLUSIONS.

Subject Divided — Physiological and Therapeutical Question — Proposition — Remarks—Alcoholic Liquors—Proposition extended— Remarks— Cautions, M. Quetelet— Conclusions, Dr. Prout, Mr. G. Combe— Ammonia, not a Substitute—Dr. Huxham, Mr. Ancell—Nourishment—Religious and Moral Question— Scripture Arguments considered— Question of Expediency— Question of Conscience—Conclusion. 171

TEMPERANCE

AND

TOTAL ABSTINENCE.

CHAPTER I.

STIMULI GENERALLY.

INTRODUCTORY.

Definition of Stimulation—Division of Stimuli—Ordinary Stimuli—Classification, Physical, Mental—Heat, a Stimulant—Light, a Stimulant—Electricity—Air and Aliment—Ordinary Mental Stimuli—Extraordinary or occasional Stimuli—Classification, Physical, Mixed, Mental—Sexual Feelings—Dancing—Athletic Exercises — Travelling — Joy — Hope — Love — Anger — Social Intercourse—Politics—Music—Eloquence—Remarks — Superfluous Stimuli—Proposition deduced.

"The stimuli of the animal economy are principally two,—air and food; but there are others somewhat subsidiary, as heat, electricity, and light."

"Organic life appears to result from the impression of stimuli upon parts endued with irritability. The principal stimuli in nature are, air, food, and heat; the principal and corresponding organs of irritability are, the heart, the stomach, and the muscular system in general."*

To excite, to stimulate, is either to originate action where no action previously existed, or to give increased energy to powers already in active operation. Allowing this definition to be correct, the exertion of Divine creative energy may in one sense be said to constitute an act of stimulation; and if

* Dr. Marshall Hall's Observations, second series, pp. 221, 224.

we recognise in the continued existence or subsistence of the universe, whether of spirit or mind, or of matter, one unbroken stream of creation, we must also recognise in it the continued stimulant activity of Divine operation, ever flowing from Him "in whom we live and move and have our being;" and, thus, tracing all life up to its only source—"the Life itself,"—we are led to the two great divisions of creation, on which, or through which, is exerted the Divine operation, or action, or stimulation, the world of mind or spirit, and the world of matter; and thus, naturally, as it were, the subject of the action of stimuli generally, falls to be considered under these two great divisions of *Mental* and *Physical*. In addition to this natural division of the subject, however, its elucidation will be facilitated by a distinct artificial arrangement into—

I. *Ordinary stimuli*—the regular unceasing action of which is necessary for the preservation of sound health, both of body and mind.

II. *Extraordinary or occasional stimuli*—which produce a certain amount of temporary exalted action of mind, or of body, or of both.

III. *Superfluous stimuli*—which are generally those comprised in the second division, abused.

I. Under the head of ORDINARY STIMULI we have the following:

A, *Physical Stimuli.*

I. Heat.
II. Light.
III. Electricity, Magnetism.
IV. Atmospheric air.
V. Aliment.
VI. Muscular motion.

B, *Mental Stimuli.*

I. Occupation of the mind with some definite object.

It is scarcely requisite to dwell upon the necessity for heat in all vital action. "A suitable temperature may be considered one of the essential conditions of life. The physico-chemical phenomena of living bodies are produced only within certain limits of temperature, which are likewise the limits of animal and vegetable life."* "The most perfectly organised body, supplied with all other conditions requisite for its activity, must remain completely inert, if it do not receive sufficient stimulation from heat;"† and we may add, even after the vital activity has been excited, should heat be withdrawn beyond a certain point, vital action is either temporarily suspended or permanently stopped.

The action of light as a stimulant, not being of such obvious universal necessity to vital action as that of heat, nor its effects and influence so prominently marked, its full power as an excitant upon animal and vegetable life has not been until lately, —indeed is scarcely yet—sufficiently well recognised, although every day it is becoming more so. "Under its influence alone can the first process be accomplished, by which inorganic matter is transformed into an organic compound."‡ The effect of the deprivation of the stimulus of light in producing blanching or etiolation in vegetables has long been practically applied, and the effect of the absence or diminution of the stimulus on animal development and health, though "comparatively little, is certainly known respecting it," is being more attended to in consequence of the present sanitary movement. Dr. Edwards, whose experiments upon the influence of light

* Professor Matteucci, Medical Times, vol. xvi, p. 487.

† Carpenter's Manual of Physiology, p. 57.

‡ Ibid., p. 45.

are well known, has remarked, that persons who live in abodes excluded from the free access of light are apt to produce deformed children; moreover, observation and experience both teach us, that persons who are habitually exposed to the stimulus of strong light are less liable to disease than those placed in the reverse condition. The disease, snow blindness, common among the natives of the Arctic regions, is produced by the powerful stimulant action of reflected light upon the eye, and strangers, from the same cause, are said frequently to suffer from acute inflammation of the organ.*

Less, certainly, is known of the effects of electricity upon vital action, than of the two former agents; there is little doubt, however, that its operation is constant, if imperceptible, in the living animal organization, whether derived, as Liebig† suggests, from "vital processes," or from sources external to the body. Moreover, "it is probable that a proper amount of atmospheric electricity is indispensable to our existence."‡ At present we know more of the effects of electric and magnetic actions in connexion with disordered states of the nervous system particularly, than we do of their general influence upon the healthy human organism. There is little doubt, however—and the recent researches of Baron Reichenbach, amid others, go far to confirm the idea,—that electric or magnetic influences are much more concerned in the varied phenomena of life, than our present knowledge or means of investigation permit to be verified.

The connexion existing between the stimulant action of the

* Mr. Edwards, Surgeon to Sir W. E. Parry's Third Voyage.

† Chemistry of Food, p. 104.

‡ M. Pallas.

atmosphere upon the human organism, its food, and its functions, is so close, that they almost necessarily fall to be considered under one head.

The stimulant property of duly aerated arterial blood is, undoubtedly, "essential to the maintenance of the vital phenomena, not only in the moving solids, but in all other parts of living bodies,"* essential to the due digestion of that food, which, in its turn, stimulates the stomach to the performance of the first process requisite for the conversion of the dead mass into the vital components of a living body. Moreover, aliment even of the blandest nature, thus prepared and conveyed into the circulation, becomes a stimulant; either producing the feeling of increased activity or energy which most feel after the products of a well-digested meal have entered the system, or displaying a still greater amount of stimulant action, by causing in some constitutions more or less of febrile excitement. It is not needed here, to insist upon the stimulus imparted to the system generally, and to every one of the vital processes particularly, by the excitant power of muscular movement, which every healthy man is compelled, or ought to undergo: the fact is generally recognised. "All enjoyment must necessarily arise from activity of the various systems of which the human constitution is composed. The bones, muscles, nerves, digestive or respiratory organs, furnish pleasing sensations, directly or indirectly, when exercised in conformity with their nature."†

We have now seen that certain ordinary physical stimuli are necessary for the sustenance of human health and life;—equally

* Alison's Physiology, Circulation.

† Combe's Constitution of Man, p. 161.

important for the preservation of vigour, not only of mind, but of body, is the stimulus resulting from the ordinary but regular action and reaction of the mind of man, originating either in daily intercourse with his fellows, or in pursuits which continuously engage the mental powers. The danger, both to the mental and physical well-being of uneducated men, placed in circumstances in which this mental stimulus has been deficient, has frequently been experienced. The cases of Sir W. E. Parry, and of Captain Murray, amid others, are familiar to most: probably these gentlemen owed much of the safety and high sanitary condition of their respective crews,—the one in the Arctic regions, the other on notoriously unhealthy Tropical stations, to their being strongly impressed with the necessity, and to their using every means for preserving a proper amount of cheerful occupation. The evils, both mental and physical, which have resulted from too rigorous an adherence to the system of solitary confinement, both in this country and in America, clearly exhibit the injurious effects which follow the withdrawal of the ordinary stimuli of the mind; and consequences somewhat similar, are frequently met with amid uneducated persons, who have retired after a lifetime spent in active business, in the vain hope of happiness, and who very often seek refuge from the aimless vacuity of their own minds, in a return to the old desk, counter, or stall. It is true that some individuals, as in the case of Silvio Pellico, of Baron Trenck, or others, have retained health of mind, or even comparative cheerfulness during long and dreary solitary confinements; but, in such cases, there was a mind within, sufficient to create an excitement for itself, and to find its interest in the familiarity of a spider or a mouse, or in the development of a flower.

The above cursory review of what we have classed as the ordinary stimuli, is sufficient to show us that these really are stimuli, though in constant action, and that as stimuli, their action is requisite for the preservation of man's daily life and health, of body and mind.

II. We pass on to the second division of our subject, the consideration of

EXTRAORDINARY OR OCCASIONAL STIMULI,

such as generally produce a certain amount of temporary exalted action, either of body or of mind, or of both, not only without actual injury, but with positive benefit.

Under the head of extraordinary stimuli, we have

A, *Physical:*

I. Alcoholic stimuli.
II. Stimulant ingesta generally; tea, coffee, spices, drugs.
III. Atmospheric changes.

B, *Mixed:*

I. Sexual stimuli.
II. Extra exercises; dancing and athletic sports.
III. Travelling, and exciting or novel scenes.

C, *Mental Stimuli:*

I. Hope, joy, &c.
II. Love, anger, &c.
III. Social intercourse.
IV. Argument, politics.
V. Music.
VI. Eloquence, written or spoken; exciting literature.
VII. Religion.

The primary physical stimuli of the above arrangement with the exception of the last, fall to be considered in our, future pages, and, therefore, require no further notice here. The beneficial stimulant effect exerted upon the human organism by atmospheric changes, is fully and clearly insisted upon by Sir James Clark,* who says, "Long residence in a very equable climate is not congenial to health, even with all the advantages of exercise in the open air. A moderate range of temperature and of atmospheric changes seems necessary to the maintenance of health." "Dr. Combe, during his residence in Madeira, remarked that the invalids were better when the temperature was less steady, and the weather more variable, than when the season was unusually mild and equable. I have remarked the same effects resulting from a long residence in some of the more sheltered spots in our own island." In the vegetable world a similar observation has been made—"A diurnal variable temperature, all else being equal, is more favorable to vegetation than a uniform temperature."

The division of extraordinary mixed stimuli includes those which exert their activity on mind and body simultaneously, whether connected with some of the highest affections of our minds, or confined merely to the lowest propensities of our natures. Unquestionably the excitement of sexual feeling is a most powerful stimulant both of body and mind; it is, too, generally agreed by the highest medical authorities, that this excitement, controlled and regulated by the higher moral and religious feelings, is beneficial to a healthy individual, at the same time there is no doubt that the abuse is capable of inflicting on man most direful evils; but neither in this case,

* On Climate, p. 68.

nor in any other, is the perversion of what ought to be a blessing, to be entered as an argument against the legitimate use of a gift from our Creator. With regard to extra exercises, such as dancing and athletic sports generally, which are only engaged in at intervals, it is certain that their beneficial effect upon the functions and health, depends quite as much upon the excitement of the mind as upon that of the body; and every one's experience must tell him how much his favorite exercise owes its renovating influence to the mental stimulation which accompanies it.

> "He chooses best whose labour entertains
> His vacant fancy most; the toil you hate
> Fatigues you soon, and scarce improves your limbs."*

Travelling, again, with its varied scenes, is to most men a source of intense stimulation both of body and mind, hence its beneficial effect upon the debilitated and the sickly, its healthy stimulation to all the functions grown torpid in the monotony of the study or of the counting-house.

Passing from the mixed to the purely mental stimuli, we find them, as stimuli, capable of exciting the affections or the passions, the intellect or the religious feeling; and the excitement commencing in the mind is found expending itself upon the bodily frame, "and especially upon the involuntary motions concerned in circulation." †

Hope and joy are most powerful stimulants. "These emotions, when they are of sufficient intensity and duration, and especially when they are strongly contrasted with the previous state of the mind, cause a slight but permanent glow on the

* Armstrong.

† Alison's Physiology, p. 257.

countenance, which contrasts with the paleness of grief; they quicken the flow of the fluids through, or the secretion on, the cornea and conjunctiva, and give brilliancy to the eye; they perhaps elevate slightly the temperature of the surface, and certainly cause it to be less easily depressed by cold. According to the observations of Sanctorius and of Bryan Robinson, they increase the insensible perspiration by the skin; and according to Dr. Prout, they increase the quantity of carbonic acid thrown off at the lungs; they have a well-ascertained effect in protecting the body against the influence not only of cold but of malaria and contagion." The excitement of pleasing emotion is frequently one of our most valuable stimulants in dangerous and depressing sickness, one of the most powerful adjuncts in convalescence; but, be it love or anger, the mild excitement of social intercourse, or the stronger excitement of politics, be it the heart-stirring eloquence of our fellow-men, poured forth, whether from the lips or from the pen, in poetry or prose, the enlivening, often maddening power of music, or higher than any of these, religion itself, we find all and each exerting their stimulant effects, either beneficially or banefully as it may be, on the mental constitution and physical organism of man.

Having now passed in brief review the various extraordinary or occasional stimuli most fitted to illustrate our subject, we find them, as a general rule, acting only at intervals, and when thus acting, exerting a marked excitant influence both upon mind and body, and surely not without benefit. The "cleared complexion"* of the hunter, the improved health of the returned traveller, the sparkling eye of love or joy, all tell of the benefit

* Budd on Diseases of the Liver.

derived from the unusual impetus imparted to all the functions. As in the microcosm, so we find in the macrocosm the same necessity existing, and learn in the continual recurrence of meteorological disturbance, that the regular course of Nature must at times be altered, in order that her health and ours may not suffer.

III. The last section of our artificial arrangement, SUPERFLUOUS STIMULI, claims but brief notice, it having been in a measure demonstrated by the foregoing remarks, that these consist mainly, if not entirely, in the abuse of those temperate excitements which man's folly converts into curses, either by seeking to carry them beyond their legitimate lengths, or to transpose them from their legitimate positions.

Enough has now been said to establish the proposition on which the opinions promulgated in the following Essay are based,—

That the healthy functions both of body and mind in man are dependent for their continuance upon a regular series of ordinary stimulant actions; and, further, that these functions are at intervals acted upon by occasional or extraordinary stimulants, which temporarily occasion their exalted and increased action, not only without actual injury, but with positive benefit. And, lastly, that these extraordinary stimulants are not liable to lose their power of beneficial stimulation, unless exerted in a disorderly and unrestrained manner.

CHAPTER II.

ALCOHOL AND ALCOHOLIC FLUIDS—THEIR NATURE, ETC.

Alcohol—Its Nature and Properties—History—Mode of Formation—Fermentation, Conditions necessary for—Grape-Sugar—Classification of Alcoholic Liquors—Fermented Liquors—Grape-Juice, its tendency to ferment—Palm-Juice—Ancient use of Wine—Classification of Fermented Liquors—Grape Wines—Classification, Characters, Proportion of Spirit—Unfermented Grape Wines—Home-made Wines of Britain, their Defects—Cider and Perry—Malt Liquors, History, Characters—Distilled Spirits, Varieties.

Alcohol, the principle on which the characteristic properties of fermented and distilled liquors depend, "is a product of the metamorphosis of sugar under the influence of a ferment."* It is a limpid, colourless, highly inflammable liquid, of penetrating smell, miscible with water in all proportions; the mixture of the two fluids gives rise to an immediate evolution of caloric, and on cooling, the bulk of the mixed fluid is found to be less than that of the two fluids separately; the specific gravity also is greater than their mean before admixture. Alcohol has at all times a powerful attraction for water, from which it is generally separated by distillation, being usually found in combination with it; the strongest rectified spirit of wine of commerce, density about ·835, containing 13 or 14 per cent. of the former fluid. Pure or absolute alcohol may, however, be obtained, and when thoroughly free from water, its specific gravity is said by the latest calculations to be ·7938, at 60° Fahr. The atomic constitution of alcohol is expressed by the formulæ: $C_4. H_6. O_2$.†

* Fownes' Chemistry, p. 384.

† Carbon 4, hydrogen 6, oxygen 2.

Pure alcohol is generally said never to have been frozen,* and it boils at 177° Fahr.; as generally met with, it "burns with a pale yellowish blue flame, the colour varying according to the strength of the alcohol: a blue flame indicates the strongest alcohol."† It is probable that alcohol was discovered somewhere about the middle of the thirteenth century, that "the alchemists were the discoverers, and like many other things, made a mystery of the matter." Michael Savonarole, who wrote a treatise in Latin on the art of making spirit of wine, an edition of which was published in 1560, more than a century after his death, informs us that it was only used as a medicine. The physicians of those days attributed to it the important property of prolonging life, and on this account it was called "*aqua vitæ*, water of life."‡ This spirit is capable of dissolving many compounds both saline and organic. In its composition it conforms to the fixed oils, but in its properties more nearly resembles the volatile oils.§ It is rarely, if ever, used, either as medicine or beverage, uncombined. Alcohol is formed by the process of fermentation, and one of the "indispensable conditions of that process, is the presence in the fermenting liquid of certain azotized substances named ferments, whose decomposition proceeds simultaneously with that of the body undergoing metamorphosis. They all belong to the albuminous principles, bodies which in a moist condition putrefy and decompose spontaneously."‖ A solution of pure sugar will not ferment however long it may be kept; ¶ it requires the addition

* Mr. Hutton is stated to have frozen it in 1813 at —110° Fahr.

† Thomson's Dispensatory, Alcohol.

‡ Donovan on Wine-Making, p. 41.

§ Prout on Stomach Disease, p. 456.

‖ Fownes' Chemistry, p. 383.

¶ Brown sugar contains sufficient azotized impurity to ferment spontaneously

of a decomposing azotized ferment, whether it be decomposing animal matter, or vegetable albumen, or gluten, or yeast, the most powerful of all. The peculiar power of decomposing animal matter (or of membrane especially), of acting as a ferment in vegetable solutions, is now an explained fact. "The identity in composition of the chief constituents of blood, and of the nitrogenized constituents of vegetable food, has certainly furnished, in an unexpected manner, an explanation of the fact, that putrefying blood, white of egg, flesh, and cheese, produce the same effect in a solution of sugar, as yeast or ferment. The explanation is simply this, that ferment, or yeast, is nothing but vegetable fibrine, albumen, or caseine in a state of decomposition, these substances having the same composition with the constituents of flesh, blood, or cheese."* As it is, however, that modification alone of sugar, named grape-sugar, which is capable of being converted into alcohol, when cane-sugar is used for its production, it must first be converted into grape-sugar by the action of the ferment.† The same is true of milk-sugar, the principle from which the wandering Tartars procure their koumiss and arica, when they ferment and distil the milk of the mare or cow.

Almost all fruits, and many vegetable juices, are capable, under favorable circumstances, of undergoing the vinous fermentation, and of yielding more or less alcohol, but in this respect the juice of the grape far excels all others, undergoing spontaneously the necessary change, and becoming converted into true wine by its own inherent power of

* Liebig's Animal Chemistry, p. 120.

† Grape-sugar, or sugar of fruits, may be obtained abundantly from sweet grapes, or sweet fruits generally; it constitutes the solid crystalline portion of honey.

fermentation; "the juice, if kept a few hours, will spontaneously ferment."*

As fecula or starch is, however, capable of being also employed for the production of alcohol, as in the case of the grains, potatoes, carrots, or even, as in Kamtschatka, of grass, it, too, must undergo the metamorphosis into grape-sugar. This metamorphosis may be imitated artificially by boiling gelatinous starch with a dilute acid, the starch during its change first being converted into a peculiar gum-like substance, named dextrine. The process is, however, effected naturally by the peculiar azotized substance, named diastase, evolved during the germination of seeds, as in the case of malting, which possesses the peculiar property of converting, at a comparatively low temperature, a large amount of starch into grape-sugar. This property is of great importance to the distiller, who can thus, with a small proportion of malt, convert a large amount of raw grain into fermentable material.† Thus we see, that though various vegetable juices or infusions may, by undergoing the vinous fermentation, form alcohol; the fermentable ingredient of all must first assume the form of grape-sugar, which, by metamorphosis under the fermenting influence, produces the alcohol, which only requires separation from the other matters by proper distillation.

Alcoholic liquors are generally classed as *Fermented* and *Distilled:* of both, the variety is very great. By fermentation is meant those changes or metamorphoses "which animal or vegetable substances spontaneously undergo, and which terminate either in the production of a vinous liquor, an acid

* Donovan, p. 12.

† Malt is, however, not absolutely necessary for this process.

liquor, or of a remarkable fetor."* It is with the first of these only we have to do in the present treatise.

Fermented liquors may almost be said to be a natural product of warm climates, from the readiness with which many of the vegetable juices take on the process. The pure juice of the grape, if left to itself in a suitable temperature, will ferment in a few hours. Indeed, "when we consider how simple and obvious the process is of obtaining wine from the grape, we are led to conclude that the invention of it must be nearly coeval with the existence of that fruit."† Perhaps, however, the most illustrative example of natural, rapid, spontaneous fermentation is that of the leghma, as it is called in North Africa, or palm toddy, so frequently spoken of by travellers. This juice, which flows abundantly from wounds made in the stem of the palm-tree, is described as resembling in flavour "very new light wine,"‡ and capable of being drank in large quantities when quite fresh; it very quickly, however, begins to ferment, and, "continually fermenting, becomes when a few days old, very strong and acrid drinking,"§ and very intoxicating. We cannot doubt, with this natural tendency to fermentation existing in vegetable juices, that fermented liquors have been known from the earliest periods; indeed, we know that Noah was acquainted with the art of making wine which would intoxicate, and he in all probability derived his knowledge from his progenitors. "With whomsoever its use began, wine was well known to Homer's heroes, one of whom speaks of it, in conjunction with bread, as the chief root of man's

* Donovan, p. 96.

† Ibid., p. 12.

‡ Wilkinson's Ancient Egyptians.

§ Richardson's Travels in the Sahara.

strength and vigour."* In Egypt, fermented wines were known and used at an early date, and probably, judging from the Scriptures at least, often to excess; indeed, ancient authors have censured that people for an immoderate love of excess. Solomon mentions spiced wine. Among the Romans, it was unlawful for women, or even for young men under thirty, to drink wine except at sacrifices. With regard to women, their regulations were very strict. In later times they were allowed it on the score of health.

In the present day, the principal fermented liquors in use are: 1, *Grape wines*; 2, *domestic* or *home-made wines from our native fruits;* the latter, however, not possessing in themselves, either sufficient sugar or fecula, to make drinkable wine, all require the addition of sugar or raisins, more or less; 3d, *liquors made from the fermented juice of the apple or pear, cider and perry;* 4th, *malt liquors from various grains, principally barley.* In addition to these, however, many more fermented drinks might be enumerated, which have been discovered and used by various nations, civilized and barbarous, over the world: such as mead from honey, which probably constituted the first fermented stimulant among the ancient inhabitants of this island; booza, made from barley,† or even from bread, in Egypt and Africa; or the koumiss, from milk, by the wandering Tartar. "The only inhabitants of the globe who do not manufacture an intoxicating liquor are the New Zealanders, (and other Australasians) and the wretched inhabitants of New South Wales and Van Diemen's Land."‡

* S. A. St. John's Hist. of Ancient Greeks.

† Lander mentions the use of beer capable of intoxicating by the natives of Central Africa.

‡ Thomson's Mat. Med., Alcohol.

In the large Chinese Herbal, it is said that wine made from *grapes* was the wine of honour presented to the viceroys, and even to the emperor; from this we might suppose that other wines were made beside grape.* The Chinese use a good many drinks from fruits.

Fermented grape wines were classed by Fourcroy into red and white wines. Dr. Paris† classes them dietetically into: 1. Sweet wines; 2. Sparkling or effervescing; 3. Dry and light; 4. Dry and strong. White wines are generally thought to agree better than the red variety, which, owing their colour, not to the juice, but to the husk of the grape, which is pressed, necessarily contain a considerable amount of astringency and extractive matter, from which the white wines are free.

Sweet wines, as may be supposed, contain a proportion of free sugar, which has not undergone fermentation; they generally, too, contain less spirit than the others. Sparkling wines contain free carbonic acid gas; the dry light wines a certain amount of uncombined acid, from which the dry and strong wines ought to be in a great measure free. The proportion of spirit in various wines, varies very greatly, and of course modifies greatly their influence upon the constitution when used by man. Mr. Brande's 'Analyses' are often quoted, and from them the following Table of the constitution of a few wines most commonly used in this country has been copied.

* Abbe Grosier, Description of China.

† Cycloped. Pract. Med., Diet.

Quantity of Alcohol. Specific gravity 8·25.

	Average in 100 parts.
Port	22·96
Sherry	19·17
Champagne	11·93
Frontignac	12·79
Claret	15·10
Marsala	25·9
Madeira	22·7
Cape	20·51
Currant	20·55
Gooseberry	11·84
Cider	9·87
Perry	7·26
Mead	17·32

As may be seen from the foregoing Table, the proportion of spirit in some of these wines is very considerable; but much of this is due to that depraved taste, which has rendered it necessary for foreigners to add spirit to the genuine wine, to render it marketable in Britain; spirit, too, which for the most part, must remain in the wine in an uncombined condition. One leading characteristic which distinguishes the grape from other subacid fruits, and materially modifies its action in a dietetic point of view, is the presence of its peculiar acid, the tartaric, which, in combination with potash and other matters, is deposited on the sides of the wine casks during the slow fermentation, being, in fact, impure cream of tartar.

It may be said, that in the present time, fermented wines only are used by man generally; there can be no doubt, however, that in former times, a species of unfermented wine was

also much used, and that the fresh expressed juice of the grape was also called wine. Thus, we read that the chief butler, telling his dream to Joseph, says, "And Pharaoh's cup was in my hand; and I took the grapes and pressed them into Pharaoh's cup." Certainly, none of the fermented wines of the ancients could contain the amount of spirits that our strong wines do; for, by the natural process of fermentation, about eight per cent. of spirit would be the maximum formed in a genuine grape wine, and the separation of alcohol by distillation being unknown, no method could be resorted to for giving an artificial strength beyond that; unless, indeed, by the process of freezing, which does not appear to have been much resorted to. It is difficult to say to what liquor the term new wine was applied, probably the fresh juice was thus denominated, but that the term was not confined to this, but extended to that which had undergone some degree of fermentation, may be assumed, from the fact, amid others, that the Apostles were accused of being "full of," or, as Peter expresses it in his defence, "drunken" with "new wine." Indeed, from the great tendency which vegetable juices, especially those of the grape and palm, have to run on into immediate fermentation in warm climates, it would, at times be difficult for any one to say whether he was drinking a fluid containing alcohol, or not, particularly in the case of palm juice. It is evident, moreover, from the simplicity of the process of fermentation, the readiness with which it commences in warm countries, and the perfect adaptation of grape juice for undergoing the requisite changes, that the natural formation of the alcoholic, must have preceded the more artificial preparation of the boiled wines, the latter method, probably being resorted to with the view of

preventing the loss of the product of the vineyard by acetous fermentation induced by extreme heat, and probably, also, from the wish of the inhabitants of a warm country, to possess a pleasant, preservable, non-stimulant drink. The thick, sweet, boiled, or strained wines, described by Pliny and Aristotle, which required dilution with water previous to use, were, in fact, conserves or syrups. Newman says, "it is observable that when sweet juices are boiled down to a thick consistence, they not only do not ferment in that state, but are not easily brought into fermentation, when diluted with as much water as they had lost in the evaporation, or even with the very individual water that had exhaled from them."* "From these considerations," says Mr. Donovan, "it is probable that the qualities for which the Romans and Greeks valued their wines were very different from those sought after in the present day; that they contained much saccharine matter, and little alcohol.† Wilkinson says, that the Mareotic wine, much esteemed in ancient Egypt was "sweet and light, with a fragrant bouquet," and did not affect the head.‡ The Egyptians, however, were said to be much in the habit of drugging their wines, and thus different qualities came to be attributed to the same kind of wine.

To the modern Egyptians, and indeed to the Moslem nations generally, wine, and all inebriating liquors, are forbidden by the Koran, "as the cause of more evil than profit;" § although, it is said that, "under the government of the present Pacha,

* Donovan, p. 25.

† Ibid., p. 25.

‡ Wilkinson's Ancient Egypt.

§ Lane's Modern Egypt, vol. i, p. 112.

the habit of openly drinking wine has become common among the higher orders."*

Unfermented wines are not unknown in the present day, and are said to be made in "parts of Syria and Palestine, according to the testimony of Professor Robinson of America, and other recent travellers of unquestionable veracity; and of late years it has occasionally been imported into Europe, and very frequently into the United States of America, from some of the eastern countries."† Indeed, many of the sherbets prepared from fruits are somewhat of the same nature, though not made to keep. The author of 'Anti-Bacchus' declares that he has made unfermented wine according to the receipt given in the work of an ancient eastern writer, who lived about the same time as our Lord, and that the wine he thus made kept good for a year in a warm apartment. Mr. Delarau, of New York, who travelled in Europe in 1840, states that in Italy he had "twenty gallons of inspissated wine, made to order, which was boiled before fermentation had taken place;" that this liquor kept perfectly sweet, and that in 1842 he "sent a bottle of his wine to Professor Silleman, of Newhaven, for distillation. The result was, that not a drop of alcohol was found in it."‡

The home-made wines of this country are not perhaps brought to the perfection they are capable of, partly from want of the knowledge of the best processes, partly also from want of sufficient keeping; they are not likely, however, to rival grape wines. Mr. Donovan remarks: "The chief defects of British fruits, so far as wine making is concerned, are the deficiency

* Lane's Modern Egypt, vol. ii, p. 350.

† Marshall's Pamphlet on Total Abstinence.

‡ Ibid., p. 15.

of sugar, and the redundancy of malic acid." Dr. Paris says, "that all those wines which contain an excess of malic acid are of a bad quality."* To all British wines the addition of sugar is necessary, so that Mr. Cobbett, who in these matters was considered a high authority, remarked—"That which we call currant wine is neither more nor less than red-looking weak rum, the strength coming from the sugar."

Cider and perry hold, as it were, a place intermediate between wines and malt liquors; the amount of spirit they contain is comparatively trifling; they generally contain free carbonic acid gas, and the prevailing acid is the malic.

The principal fermented liquors derived from grain, are beer, ale, and porter, which are all made from malted barley. The invention of an intoxicating liquor derived from corn, has been attributed to the Egyptian deities Osiris and Isis; the tradition at least indicates the fact that the art was early known in that country. "Beer is mentioned by Strabo, Diodorus, and Herodotus, under the name of zythus, as being used among the ancient Egyptians as a substitute for wine. The Egyptian beer was made from barley; but as hops were unknown, they were obliged to have recourse to other plants, in order to give it a grateful flavour."† The description given by Athenæus of the Egyptian beer, is that it was very strong, and had a very exhilarating effect, so much so as to produce intoxication like the strongest wines. At the present day, boozah made from barley-bread "is commonly drunk by the boatmen of the Nile, and by other persons of the lower orders."‡ In China, a beer is made from rice, and in America from maize.

* Cycloped. Pract. Med., Diet.

† Wilkinson's Ancient Egypt, vol. i, p. 171.

‡ Lane's Modern Egypt, vol. i, p. 112.

"After the general introduction of agriculture into Britain by the Romans, ale or beer became the common drink of all the British nations, as it had long been of all the Celtic people on the continent."* It was not, however, until the reign of Henry VIII that the hop was used to flavour liquor, other, but less pleasant, useful bitter herbs being used, sometimes none at all. Ale, "Vinum Britannicum" as it has been called, is generally found of two varieties, pale and dark, according to the drying of the malt. The dark ales are generally the heaviest; the light-coloured are also lighter in every way, and more strongly hopped; they are brewed chiefly for exportation. The amount of sugar in ale varies, of course, according to the extent of the fermentation; the further this has been carried, the more the wort has been attenuated, the greater will be the proportion of spirit; and as this is formed at the expense of the saccharine ingredient, that of course must be proportionally lessened. In lighter ales the attenuation may go on until all the sugar is transferred into alcohol; but in strong ales, produced from highly-concentrated worts, it is checked by the quantity of alcohol formed, the spirit being a powerful counter-agent of fermentation; in these ales, therefore, a quantity of sugar always remains unchanged. It is evident, then, that the amount of alcohol and of solid matter varies greatly in malt liquor according to age, &c. Strong ales contain between 7 to 9 per cent. of spirit, and between 10 and 16 per cent. of solid; lighter ales from 4 to 7 per cent. of spirit, and from 5 to 10 per cent. extract. The India pale ale, from various breweries, has been analysed by Dr. Ure, and found to average 6 per cent. of alcohol, and 5 of solid matter. Ales of course

* Donovan, p. 29.

are liable to various adulterations. Porter, which is brewed from malt very highly dried, differs in many respects from ale. Dr. Paris says: "Much has been said upon the fraudulent adulteration of this article, but we are inclined to believe that these statements have been exaggerated."* Mr. Donovan, however, affirms that until the interference of the legislature, porter was liable to every species of adulteration. Mr. Taylor says: "According to Dr. Ure, the best London porter always contains opium;" but adds, "in repeating Dr. Ure's experiments, I have not obtained any results indicative of the presence of opium in this liquid."† Iron is contained in malt liquor from various causes, sometimes designedly, but also from the vessels employed; being held in solution by the excess of carbonic acid.

Distilled liquors are not less numerous than the fermented, and man in every quarter of the globe has taxed his ingenuity, and generally successfully, to find the means for their manufacture. The distilled liquors most commonly in use in this country, are brandy, whisky, gin, and rum; in addition to these we have arrack, the Russian schnapps, the American peach-brandy, the German kirsch-wasser, the Swiss gentian-spirit, and even the Kamtschatkan spirit from grass. All these ardent spirits are the products of fermentation in the first place, and are separated from the refuse of the articles which yield them, by the familiar process of distillation by heat. They contain a much larger proportion of alcohol than purely fermented liquors, indeed alcohol and water make up their constitution, the peculiar flavour of each depending chiefly on

* Cycloped. Pract. Med., Diet.

† Med. Jurisprudence, p. 279.

essential oils derived from the materials from which they are distilled. Gin, Geneva or Hollands from its impregnation with juniper oil, was first introduced as a diuretic medicine, and ultimately became an object of trade. Dr. Paris supposes that the peculiar flavour of cogniac depends on the presence of an etherial spirit formed by the action of the tartaric acid or acetic acid of the wine on alcohol. Brandy and rum "contain about fifty-three per cent. by measure of alcohol, while gin and whisky are rather stronger, gin containing as much as fifty-seven per cent."*

* Taylor's Med. Jurisprudence, p. 278.

CHAPTER III.

Action of Alcohol on Dead Matter—On Living Surfaces—External, Cooling Effects, Irritant — Internal, Alimentary Canal — Influence of Habit — Poisonous Doses—Cases—Diluted Doses—Observations of Dr. Beaumont, Remarks on—Action on Serous Membranes.

The action of alcohol applied to dead animal matter is apparently that of an astringent. It condenses the substance generally, and coagulates the albumen. Applied to a living animal surface, as the human skin, the first action of the spirit is also astringent, according to Hastings producing contraction of the capillaries; this effect is well exhibited by dropping strong alcohol upon the florid granulations of a healing ulcer, these immediately become blanched. This astringing power is, however, of short duration, the redness returns with increased intensity, and the stage of reaction quickly succeeds. If the spirit be strong and long applied to the skin, or to a living animal surface, inflammation will probably result. This effect is counteracted by diluting well with water, as in the evaporating spirit lotions so extensively used in surgical and medical practice; but even in this case, if the use of the lotion be soon dropped, heat and redness are apt to return with increased intensity. When applied to surfaces within the body, however, the evaporating effect is of course lost, and the primary astringent effect being but momentary, the excitant power of the spirit is at once quickly manifested, and becomes the characteristic mode of action. Availing

himself of this fact, Dr. Marshall Hall strongly recommends* in cases of chest affection, the continued use of a spirit lotion applied on folded linen under the dress, thus avoiding the cold of evaporation, and maintaining a constant gentle stimulant effect upon the skin.

When strong ardent spirit is swallowed by any one unaccustomed to its use, the first effect is a sensation of pungency, with dryness and astringency of the mouth, fauces, and œsophagus, especially of the upper portion of the tube; thence, and in the stomach, the sensation is more that of warmth diffusing itself from that viscus as from a centre; these effects, however, are said not to be so sensibly experienced by persons in the habit of drinking strong spirit. Indeed, "it is remarkable to what an extent the custom of employing strong stimulants renders the alimentary canal capable of withstanding with impunity the most acrid poisons. Tartra mentions an instance of a woman, who when she commenced drinking, took common spirits, and then passed on to alcohol, but not finding that sufficiently stimulating, took to drinking aqua-fortis, which she continued to do for some time without suffering the smallest inconvenience."† This of course must be considered a *very* extreme case. An anecdote is, however, told by Hogg, of an old highlander to whom a country shopkeeper gave a dose of aqua-fortis in mistake for whisky, and who, greatly to the relief of the seller, who thought he had surely killed his customer, returned at his next visit to the town "for a dram from the same as before."

When concentrated alcohol is taken into the stomach, if it

* Observations in Medicine, first series, p. 26.

† Thomson's Lectures on Jurisprudence, Lancet, 1836-37.

does not produce sudden death it occasions severe inflammation; this Sir Benjamin Brodie found to be the case in animals examined after poisoning by alcohol. Dr. Percy and others, who have experimented on animals, have found similar effects. In cases occurring in the human subject, which have afforded an opportunity of examining the mucous membrane of the stomach after death, either from drinking or from some accidental cause after strong drink had been taken, the appearances have been just what we might expect; "the stomach has been found inflamed, the mucous membrane being in one case of a bright red, in another of a dark brown colour. In a case observed by Dr. Geoghegan, in which a pint of spirits had been taken, and which proved fatal in eight hours, black extravasation was found on the mucous membrane; but no trace of alcohol could be detected in the contents of the stomach."* A case of poisoning by gin in a boy between seven and eight years of age is related by Dr. Chowne.† The boy lived sixty-seven hours and a half in a state of semi-coma, and died from the lungs becoming implicated. In the post-mortem examination the following account is given of the stomach: "The stomach was empty, its outer surface rather paler than usual, no remarkable vascularity of any part. The inner surface was uniformly of a pale hue, and free from patches or discolorations, with the exception of a portion about the size of the palm of a child's hand, near the cardiac orifice; this exhibited an arrangement of very small vessels visible under and in the mucous coat; they had an arborescent form and were florid. This might have arisen either during

* Taylor's Medical Jurisprudence, p. 278.

† Lancet, 1838-39, vol. ii, p. 238.

digestion or from the irritation of abstinence:" it is more probable, however, that it was the remains of alcoholic irritation. Dr. Percy* quotes a case from 'Cooke on Nervous Diseases,' of a man who died in the London Hospital, after hard drinking, in whom "the internal coat of the stomach was inflamed in patches, as also the internal and external coat of the intestines." Another case is related by Evan Thomas, Esq., which occurred in Liverpool. "Mr. T——, æt. 26, a civil engineer of very intemperate habits, but who, notwithstanding, has enjoyed very good health, on the evening of the 27th of March, after an early dinner, drank in the course of a few hours about a pint of strong whisky, and during the evening he made a bet that he could drink a pint of raw rum, one half of which he drank at once, and in three minutes the other half. Not long afterwards (five minutes) he was perceived by his companions to be fast asleep, snoring, his mouth open, and the saliva flowing from it; he became quite insensible and fell backwards in his chair. The man was quite comatose for some time, but next day was again sensible and rational, but feverish and otherwise ill; on the 30th he died rather suddenly. In the post-mortem examination it is said, "there was a large patch of the mucous membrane of the stomach of a cherry-red colour, the capillaries ramifying on the villi, looking as if they had been injected."†

When, therefore, a strong dose of concentrated alcohol or spirit has been taken into the stomach, and has not occasioned instant death (which we shall see hereafter it is capable of doing), it probably causes extravasation of blood, or acute

* On Alcohol, p. 17.

† Medical Times, vol. xii, p. 219.

inflammation of the lining membrane of the stomach and bowels, and even of the peritoneal coat: should the inflammatory attack not prove fatal, on its subsidence it may leave the mucous lining comparatively uninjured, but more probably somewhat thickened and functionally weakened, or in such a state of chronic inflammation as will lay the foundation of future, perhaps of malignant disease.

The immediate effect of a moderate quantity of diluted spirit as it is usually employed, or of wine or malt liquor, is of course very different from that of the poisonous irritant doses of alcohol we have just been considering. The former, however, in most cases communicate a sensation of warmth in, and extending from the stomach, and there is no doubt produce some degree of vascularity of the membrane. This has been proved to be the case by Dr. Beaumont, who enjoyed the unique opportunity of actually seeing the various processes carried on in the stomach of St. Martin, an opportunity, of which, fortunately for science, he took the best advantage. "On examining St. Martin's stomach after he had been indulging freely in ardent spirits for several days, Dr. Beaumont found its mucous membrane covered with erythematic (inflammatory) and aphthous patches, the secretions vitiated, and the gastric juice diminished in quantity, viscid, and unhealthy. Two days later, when the state of matters was aggravated, the inner membrane of the stomach was unusually morbid, the erythematic appearance more extensive, the spots more livid than usual: from the surface of some of them exuded small drops of grumous blood; the aphthous patches were larger and more numerous, the mucous covering thicker than common, and the gastric secretions much more vitiated." "After a few days of low

diet and the use of mild diluents, the coats of St. Martin's stomach were seen to resume their healthy appearance." "Dr. Beaumont adds, that in the course of his experiments, diseased appearances of a similar kind were frequently observed, generally, but not always, after some appreciable cause. The free use of ardent spirits, wine, beer, or any intoxicating liquor, when continued for some days, has invariably produced these morbid changes."* There can be no doubt that the continued and too free use of alcoholic drinks, even in a diluted form, will give rise to chronic derangements of the stomach, and organic changes of its mucous membrane; indeed, we have evidence of this in the frequent occurrence of stomach disease in drinkers. Still it is a question whether the appearances described by Dr. Beaumont as occurring in the solitary case of St. Martin, are to be taken as a type of what happens in all individuals under similar circumstances, or if they do, whether they are of as important a nature as we should at first be inclined to think them. Dr. Beaumont says, that not only were the diseased appearances above described observable after the use of stimulants, but also from "eating voraciously or to excess, swallowing food coarsely masticated or too fast." Now, if such serious signs of diseased action are liable to be developed in the stomach by causes which certainly are in daily, constant operation, with the greater proportion of individuals, not only in this but in other countries, it is somewhat singular they are not oftener noticed and noted in post-mortem examination; for when observed they would certainly be alluded to; and we are sure that the high living, both in food and drink, of the rich, the hurried meals of the anxious man of business, the

* Combe on Digestion, p. 145.

unwholesome food and frequent drinking habits of the poor, afford abundant cause for their development. Indeed, any medical man finding such morbid changes in the stomach, would be quite inclined to ascribe them to the action of an irritant poison; for, in truth, the diseased appearances described by Dr. Beaumont are more intense than those which are stated to have been presented after poisoning by alcohol in a concentrated form. Again, these appearances are described as arising in the stomach of St. Martin in the course of a few days, and going on from bad to worse, as the causes were continued in operation. Now, we know that thousands in all conditions of life are exposed to the operation of the causes which gave rise to such serious appearances in St. Martin, not for days, but for months and years, without suffering, and their stomachs are found healthy after death, which we could scarce expect were we to establish St. Martin's case as a rule for all others; indeed, judging from the progress of disease in the body generally, it is difficult to conceive, how morbid changes such as those described by Dr. Beaumont, could continue for any length of time in an organ like the stomach, and that organ exposed to a constant renewal of the irritation that originated them, without degenerating into serious organic change of structure; or, running on at the rate they were doing, quickly terminating life. These considerations ought to render us somewhat cautious before deducing too much from the solitary case of St. Martin, interesting and instructive though it be. One thing, however, requires notice. St. Martin was a man apparently in good health, and evidently possessed of very energetic digestive powers; judging from physiological facts generally, it is easy to conceive that in such a case the local action of stimuli would be more especially

manifest, and in all probability more likely to cause irritation, than in an individual whose functions were below par.

In depressed states of the system, the mucous coat of the stomach is said to be pale, and deficient in vascularity, and in such a condition must, undoubtedly, be less susceptible of the action of a stimulant; indeed, we see a parallel fact constantly illustrated in medical practice in the use of epispastics, we all know that under diminished power of the system the action of a common blister is both longer in being developed, and weaker in its action than under the contrary state. Let it here be understood that these arguments are not in any way directed either to impugn Dr. Beaumont's accuracy, or to uphold the abuse of alcoholic stimulants, by making the injurious consequence appear less than it really is; the evils they occasion are only too widely distributed, too well known to medical men; but, at the same time, considering how strange the appearances of internal human organs, in actual living operation, are to the eye of the physiologist, too much must not be founded on one case or set of observations, however carefully examined and conducted, especially if the results be not found in accordance with facts generally. Considering the various conditions in which man is liable to be placed, we can scarce imagine that generally ill-used organ, the human stomach, so constituted as upon any slight error of diet, or even from imperfect mastication of food, to be liable to take on diseased action, or at least its appearances, of so formidable a nature as that described. It is to be feared, were it so, our stomachs would not last the time, nor do us the service they now perform: we must not forget, however, how much custom will do to reconcile the viscus to the reception of irritant matters. Still,

notwithstanding its resisting power, notwithstanding strength of constitution, and the influence of habit, if a healthy stomach be irritated and excited by stimuli for which it has no need, disorder and disease can scarcely fail to be the result. The organ "may resist the deleterious influence of occasional intoxication; but a regular train of intemperance never fails to produce its baneful influence both on the body and the mind. By degrees, the mucous membrane of the stomach, suffering under repeated attacks of inflammation, and even the other coats of that viscus, undergo changes of structure, and indurations sepervene, which occasionally degenerate into cancer of the pylorus."*

The action of alcohol upon a serous membrane is just what we might expect,—it produces inflammation. Perhaps the best illustration of this is the use of port wine injection in hydrocele; here, after the accumulated fluid is withdrawn by tapping, the wine is injected, and by producing adhesive inflammation in the walls of the sac, cures the disease. The same wine is sometimes most beneficially employed in poultice to stimulate the exhausted powers of sloughing tissues.

* Thomson's Mat. Med., p. 205.

CHAPTER IV.

ALCOHOL, ITS EFFECTS ON THE NERVOUS, CIRCULATING, AND MUSCULAR SYSTEMS.

Primary Effects on the Nervous Extremities and Masses, M. Ségalas, Andral—Circulating System—Absorption, Proofs of rapid, Dr. Percy, Magendie, MM. Bouchardat and Sandras—Affinity for certain Textures, Dr. Budd—Effect on Blood, M. Ségalas, Dr. Percy, Dr. Peters—Remarks, Dr. Prout,—Liebig—Effects on Nervous System, Directly on Brain—Cases, Dr. Percy, Dr. Forbes, Dr. Wilson Philip—Remarks—Iris affected, Mr. Bedingfield—Effects on Muscular System, Diminished change of Tissue, Influence of External circumstances—Muscular Exertion, Dr. Guy—Nervous excitement—Diffusion through Body, Breschet—Effect in Retarding Development.

As already observed, when a small quantity of moderately strong alcoholic liquor reaches the stomach, the first sensible effect is a feeling of warmth in and around that viscus, not unpleasant if the fluid be of moderate strength; but if the strength be great, in many persons, especially those unaccustomed to the use of spirit, the sensation is one of pain. The effects which follow the introduction of a large quantity of moderately-diluted alcohol into the stomach are thus described by an esteemed writer on therapeutics: he says, "we find that the first effect is the local excitement of the viscus, indicated by the sensation of heat in it, an effect, the result chiefly of the impression of the alcohol on the gastric nerves increasing the sensibility of the organ; this impression is next conveyed to the brain, spinal marrow, and entire nervous system; ideas of unusual brilliancy pass through the mind. As the power of the stimulus increases, all control of the will is suspended;

the ideas are then irregular, and, instead of being combined in such a manner as to produce even agreeable conceptions, they arise in the most incongruous order; the extent of the excitement of the cerebro-spinal centres becomes apparent in the unusual vivacity of the eye, the swelling of the veins of the neck, and the beating of the carotids; but new symptoms indicating cephalic congestion quickly follow, namely, pain in the frontal region, the head drops on the chest, the eyes lose their expression and are half closed; the physiognomy is altered and vacant; the voluntary muscles cease to act; the arms are pendent, or their movements are irregular; the legs cross one another in the effort to walk; vertigo supervenes, and delirium follows. The exhausting influence of such a state is too great to continue; in a short time collapse, and sleep, resembling that of apoplexy, follow."*

Very similar to the above is the description given by another writer, who divides the action of alcoholic stimuli upon the brain into three different stages. "During the first there is arterial acceleration; during the second venous retardation; and the last cerebral compression." He says: "The first stage is marked by a gradual and agreeable diffusion of warmth over the whole body, by a gentle increase of the muscular power, by an exaltation of the nervous energy; the countenance becomes full of animation; there is a flush upon the cheek, a brilliancy in the eye; all the functions of life are more actively performed; the circulation acquires a febrile rhythm, the cutaneous warmth is increased, the phenomena of excitement become marked; the mind participates in them; wit, joy, gaiety are excited; or if mirth or imagination, or any

* Thomson's Mat. Med., p. 204.

morbid feeling be predominant in the mind, it is displayed, and exuberantly indulged in. If the stimuli be now continued, a degree of torpor is induced, both mental and bodily; perception is blunted; there is a general languor, giddiness, an obscurity of vision, incoherence of ideas, and incapability of exercising volition; a depression of spirits, nausea, sickness with vomiting occur, until the third stage supervenes, when a peculiar state between sleep and stupor is observed, to which the term somnolence has been applied."* The evident phenomena which follow the moderate or immoderate use of alcoholic fluid are too well known to admit of much variety in the description; as to the mode, however, in which these phenomena are excited, there exists some controversy.

By the first-quoted writer, Dr. A. T. Thomson, the chief cause of the phenomena excited by the action of alcohol upon the living body is said to be its impression primarily upon the nervous system, and more particularly upon the extremities of the nerves distributed to the mucous surfaces of the mouth, œsophagus, and stomach. This is supposed to be proved by the fact, "that intoxication is produced much more rapidly, and by a much smaller quantity of spirit, when it is taken into the stomach in such a manner that the nerves of the mouth, and those of the tongue and fauces, shall be topically acted upon;" and further, "by the fact that a person who is intoxicated becomes often suddenly sober after vomiting." It must be remembered, however, that not only would the slow imbibition permit of the freer absorption of the spirit from all the surfaces over which it passed, but that it would also allow of much of the vapour entering the system by the lungs.

* Dr. Sigmond, Lancet, vol. ii, 1837-38.

Another writer advocates somewhat similar views to those of Dr. Thomson, as follows: "A single moderate dose of alcohol, suitable for the individual, produces effects which are entirely limited to the viscera of the abdomen. They extend themselves from the solar plexus of nerves to the organs upon which the splanchnic nerve is distributed, and excite in these a livelier action." "A large quantity, or several small doses repeated at short intervals, extend the action beyond the sphere of the splanchnic nerve, even to the spinal chord, the brain, and entire nervous system."* There can be no doubt, however, although "the first impression made upon the nerves of the stomach is communicated to the cerebro-spinal centres, and simultaneously from them to the whole system," that "this sympathetic action is soon augmented by the absorption of the alcohol, and its immediate application to the organs themselves. According to the experiments of M. Ségalas, diluted alcohol injected into the veins and bronchial tubes, or applied upon serous membranes, produces intoxication as rapidly as when it is taken into the stomach; and this effect is retarded or accelerated by circumstances that retard or quicken absorption."†

Andral thus expresses the same opinions: "We are induced to think that they (alcoholic drinks) may act, not only sympathetically from the stomach, but also exercise a direct influence on the brain itself. This is the more probable, because after death the odour of alcohol has been found disseminated through the substance of that organ."‡ The actual presence

* Penny Cyclopædia, art. Alcohol.

† Thomson's Mat. Med., p. 207.

‡ Lancet, vol. i, p. 395; 1835-36.

of alcohol in the brain, as we shall see hereafter, has been fully proved. The immediate effect of alcoholic stimulant action upon the extremities of the gastric nerves, is well shown in the case of headache arising from the presence of undigested food in the stomach, owing to deficient energy in that organ. This headache frequently occurs to people of weak digestion, who, being accustomed to stimulating food, make a meal of that which does not sufficiently excite the nervous power of the stomach; it may also be occasioned by a dose of magnesia, chalk, or whatever neutralizes the gastric juice. We can scarce attribute the headache thus caused to any other source than the effect of indigestible matter on the extremities of the gastric nerves: the disagreeable symptom is almost instantaneously relieved by a stimulant, either alcoholic or aromatic. This headache is quite the reverse of that caused by excess of acid in the stomach, which would only be aggravated by a stimulant, and is best relieved by a dose of alkali. The direct action, moreover, of alcoholic stimulant upon the gastric nerves, is (as will be hereafter shown) clearly evinced in cases of sudden death, resulting from the rapid ingestion of a large quantity of ardent spirit.

Rapid, however, as the action is of alcohol upon the nervous system primarily, it is almost equalled in rapidity by the absorption and transmission of the spirit through the body generally, especially when favoured by circumstances. It very quickly reaches, and acts directly upon, the brain itself. This fact has been frequently verified. One case, often quoted, is that of a man who was carried into the Westminster Hospital dead, having just drunk a quart of gin for a wager. The evidence of death being quite conclusive, he was immediately

examined, and within the lateral ventricles of the brain, was found a considerable quantity of limpid fluid, distinctly impregnated with gin, both to the sense of smell and taste, and even to the test of inflammability.* In one of Dr. Percy's experiments,† however, we have conclusive evidence of the extreme rapidity with which alcohol reaches the brain. In the experiment referred to, ℥ij and ʒiij of alcohol, sp. gr. 850°, were injected into the stomach of a full-grown spaniel. "Scarcely was the injection completed, when the animal uttered a loud plaintive cry, and, being dropped, fell lifeless to the ground. Not a gasp was afterwards taken, nor after the lapse of one or two minutes could a single pulsation of the heart be felt; the function of respiration, and the action of the heart, remarkable to say, were suddenly and almost simultaneously arrested." Dr. Percy remarks: "Never did I see every spark of vitality more effectually and more instantaneously extinguished!" In this case alcohol was separated from the substance of the brain by distillation, differing from the case above mentioned, in which the fluid was found effused in the lateral ventricles. "Now it may be observed, that not only must alcohol have been conveyed from the stomach to the brain in the course of one or two minutes after the injection, for at this period the heart's action ceased, but that a considerable quantity also must have passed into the current of the circulation; for the actual amount of alcohol yielded by the brain in this instance equalled, if not exceeded, what the experimenter had in general obtained when the poison had been allowed much longer time for absorption. Besides, the

* Lancet, 1836-37, vol. i, p. 215.

† Percy on Alcohol, Exp. vi.

blood furnished an abundant quantity of alcohol. It is essential to remark that the animal, for a day or two before death, had received but a very scanty supply of nourishment, so that the condition of the stomach and intestinal canal was extremely favorable for rapid absorption, as may be concluded from the beautiful experiments of Magendie. The empty condition of the stomach may also serve to explain the extraordinary rapidity with which the alcohol produced its effects in this instance."*

There is no doubt that alcohol finds its way directly into the blood by the veins, probably by endosmose. This has been fully proved by various physiologists, among others, by Magendie, who, in order to discover whether drinks are absorbed along with the chyle, made a dog swallow a certain quantity of diluted spirit during the digestion of his food; in half an hour afterwards the chyle was extracted and examined; it exhibited no trace of spirit, but the blood exhaled a strong odour of it, and by distillation, yielded a sensible quantity. The results of the experiments of Magendie have been lately verified by MM. Bouchardat and Sandras, who have performed a "series of experiments with the view of ascertaining the mode in which alcohol is absorbed, and the changes which it undergoes in the system. Their first experiments were made upon dogs, which were killed two hours after the administration of a quantity of alcohol. The chyle and blood were separately examined for that fluid, which was found totally absent in the former, but present in minute quantity in the latter. Acetic acid was also detected in the blood by distillation with sulphuric acid, after the separation of the alcohol

* Percy on Alcohol, p. 62.

which it contained. Owing to the difficulty of getting dogs to take spirituous fluids, they afterwards made use of fowls and ducks, and it was found that in most cases where the blood was taken sufficiently soon after the administration of the alcohol, both that substance and acetic acid could be detected in it in minute quantity. Very rapid absorption also takes place, and in one experiment, the authors found that three fourths of the spirit administered was absorbed in less than twenty minutes."* It is generally said that diluted alcoholic fluids are more readily imbibed by the vessels of the stomach than stronger ones, and that this is probably the reason why weak wines will often affect the head more quickly but not so permanently as the stronger kinds, and also why the kidneys are so much more easily and quickly excited by weak alcoholic drinks than by the more potent ones; it is difficult to imagine how they can enter the circulation more quickly than was found to be the case in the experiments just quoted.

The alcoholic fluid once having entered the circulation, becomes of course distributed throughout the body; at the same time, however, it appears to have an affinity, so to speak, for certain organs, textures, and secretions. As might naturally be expected, it is detectible largely in the liver, in its blood and bile. Indeed, the direct transmission of the alcoholized blood by the portal vessels is the immediate cause of the diseased livers of drinkers of ardent spirits. Dr. Budd says,† "The spirit is absorbed by the blood-vessels, and being conveyed at once to the liver, exerts an immediate action on

* Monthly Retrospect of Medical Science, p. 5.

† Diseases of Liver, p. 117.

its tissues." "The imflammation of the areolar tissue in the portal canal, is probably owing to diffusion of alcohol through it from the portal veins. We can readily fancy such diffusion taking place if we consider how volatile alcohol is, and how readily it permeates animal membranes and tissues." Further, the same author remarks, "In adhesive inflammation of the liver (cirrhosis), brought on by spirit-drinking, the physical cause of the inflammation is brought by the portal blood, and the capsule is not primarily affected." Dr. Percy found that in dogs poisoned by alcohol, he could recover the alcohol from the blood, the brain, and various other organs, but in greatest quantity from the liver.

The effect of the immediate action of strong alcohol upon the blood, is a point still open to much controversy in consequence of the very various accounts given by various experimenters. According to Ségalas, "alcohol introduced into the jugular and crural veins of animals produced effects according to its quantity. Half an ounce instantly killed them, and the blood was found very much changed; its appearance resembling milk that is turned sour. The lungs were reddened, and firmer than natural. The same quantity diluted with four or five times its weight of water was followed by complete intoxication, loss of motion, insensibility, life only shown by abdominal breathing, and a scarcely perceptible pulse. One drachm, diluted, made the animal stagger for a few minutes, appearing soon afterwards as if nothing had happened. Return to health was in the ratio of the elimination of the alcohol with the pulmonary transpiration. By watching, and repeating the last experiment as soon as the vapour from the lungs ceases to afford the alcoholic odour, an ounce may be passed through

the blood of a dog, weighing thirty pounds, in an hour. The same quantity diluted, and injected at once, stopped the respiration, and the heart ceased to pulsate in two or three minutes, and after death the blood was always altered, having a creamy appearance, and being uniformly thickened, but not grumous, as when pure alcohol is used. No modification of these effects of alcohol was observed after dividing the eighth pair of nerves. These experiments are said to prove that concentrated alcohol produces a chemical action on the blood; that diluted alcohol injected into the veins occasions immediate inebriation; that intoxication subsides as the alcohol is removed from the blood; that the degree of intoxication is in proportion to the quantity of alcohol received into the blood; that extreme intoxication and death coincide with a manifest alteration of the blood, and very slight effects on the solids."* On the other hand, Dr. Percy found the effects different. In one experiment (xi) ℥ss. of alcohol, sp. gr. 840°, was slowly injected into the jugular vein of a terrier, and repeated a second time in nine minutes after. In thirty seconds from the second injection, the heart ceased to beat. The chest was immediately opened, and the superior cava opened with the point of a scalpel. "A perfectly *fluid* stream of blood issued from the puncture on slightly compressing the right auricle and ventricle. Not the slightest appearance of coagulum was found in this ventricle and auricle, which were distended with blood." In another of Dr. Percy's experiments (xii), after the injection of ℥iss of alcohol, sp. gr. 840°, in three portions, the chest being opened immediately after death, the vena cava and right side of the heart were distended with dark, and, excepting about ʒss.

* Ancell on the Blood. Lancet, 1839-40, vol. ii, p. 443.

which at first issued from a small puncture in the superior cava, with perfectly fluid blood. The 3ss. which at first issued was coagulated, and consisted of reddish-brown flocculi. "Dr. Percy remarks, "This trace of coagulation does not invalidate my former conclusion" (that death was not caused by coagulation of the blood), "for it must be borne in mind that the third injection was not made until the heart had ceased to beat for some time. Dr. Percy also found that where alcohol had passed into the circulation from the stomach, in dogs poisoned by the spirit, the same condition of the blood existed; it was dark and fluid. Dr. Peters, in the 'New York Journal of Medicine,' in commenting upon the pathological effects produced by alcohol, observes, that the most important appearances are the fluid and venous condition of the blood, and the great superabundance of fat. According to Steinheimer and Roesch, alcohol acts directly upon the blood, and drunkenness is owing to an alcoholic venous plethora, in which the proportions of hydrogen and carbon in the blood is much increased."*

It is probable that the discrepancies respecting the direct action of alcohol upon the blood, are owing to various incidental circumstances, such as the condition of the blood at the time; the strength of the alcohol; the rapidity or slowness of its injection. One thing, however, appears to be well confirmed, which is, that the effect of intermixture of alcohol with the blood tends to keep up the venous condition for a considerable time. According to Dr. Prout, after taking alcohol, the excretion of carbonic acid from the lungs is at first diminished, languor, yawning, and drowsiness being the consequence; as

* Medical Times, Nov. 22, 1845.

these pass off, however, the excretion becomes greatly and abnormally increased for some time. There can be no doubt that the tendency of alcohol to maintain the venous condition of the blood, is in great measure owing to the elements of the spirit combining with oxygen in the body, and that its carbon and hydrogen are given off as carbonic acid and water. "The oxygen which has accomplished this change must have been taken from the arterial blood, for we know of no channel save the circulation of the blood by which oxygen can penetrate into the interior of the body." "Owing to its volatility, and the ease with which its vapour permeates animal membranes and tissues, alcohol can spread throughout the body in all directions. If the power of the elements of alcohol to combine with oxygen were not greater than that of the compounds formed by the change of matter, or that of the substance of living tissues, they (the elements of alcohol) could not combine with oxygen in the body." Liebig further remarks, "It is consequently obvious that by the use of alcohol a limit must rapidly be put to the change of matter in certain parts of the body. The oxygen of the arterial blood, which, in the absence of alcohol, would have combined with the matter of the tissues, or with that formed by the metamorphosis of these tissues, now combines with the elements of alcohol. The arterial blood becomes venous, without the substance of the muscles having taken any share in the transformation."*

However important, physiologically and pathologically, may be the effects of alcohol upon the blood, no less important, and certainly more clearly apparent, are its direct effects upon the nervous system. We have seen that, probably, the first effect

* Liebig's Animal Chemistry, p. 240.

of alcohol taken into the stomach, is its action upon the extremities of the nerves distributed to that organ, and to the upper portion of the alimentary canal: very shortly, indeed in less time than could be thought possible, had not experiment proved it otherwise, these effects become lost in those produced in the nervous system at large by the direct application of the alcoholic stimulus, and the blood modified thereby, to the nervous masses themselves. The rapidity with which alcohol is conveyed to the brain after it has reached the stomach has now been fully proved. One case has been already alluded to, which occurred in the Westminster Hospital, in which death occurred almost immediately after drinking a quantity of spirit, and in which—immediate examination being instituted—alcohol was most certainly present in fluid contained in the ventricles of the brain; further, in Exper. vi of Dr. Percy, in which a full-grown spaniel was instantaneously destroyed by the injection of a quantity of strong alcohol into the stomach, and a portion of the spirit afterwards separated from the substance of the brain by distillation, "the alcohol must have been conveyed from the stomach to the brain in the course of one or two minutes after the injection. Cases such as these show how very difficult it is to discriminate between the effects produced upon the individual organs or systems of the body, and the aggregate of mixed symptoms which must be so very quickly evolved. For a considerable time the presence of alcohol in the blood was denied; that, however, having been proved, it was next sought for in the nervous tissues. One of the earliest cases in which its presence was clearly made out, was that in the Westminster Hospital already referred to. Another case was early reported by Dr. Ogston, of Aberdeen, of a

woman who was supposed to have been drowned when intoxicated; nearly ℥iv of fluid, "having all the physical qualities of alcohol," were discovered in the cerebral ventricles. In the 'Illinois Medical and Surgical Journal,' a case is recorded, in which the medical man, who was summoned as a witness before the coroner, was enabled, at the post-mortem examination, to discover the presence of alcoholic odour in the fluid in the ventricles of the brain of a man who had been drinking for several days before death. The odour "was so apparent, that it was recognised by every member of the jury."* These, however, are cases of impregnation by alcohol of fluid effused into the ventricles: by the numerous and successful experiments of Dr. Percy, its unequivocal presence in the substance of the brain has been fully proved, it having been procured from it by distillation, not only in the case of dogs, but in the human subject; indeed, it would seem from the above experiments, that alcohol possesses some strong affinity for nervous matter. Dr. Carpenter remarks—"that alcohol has some peculiar relation to nervous matter would appear from its power of stimulating the nervous system to increased action." That its direct application to the nervous mass has this power of stimulating to increased action, has been proved by Dr. Wilson Philip, who "having laid bare the spinal marrow and brain of an animal, and dropped some alcohol upon them, found that the motion of the heart was increased, and in the most marked degree, when the spirit was applied to the cervical portion of the spinal marrow; most feebly, when applied to the lumbar portion."

From the review we have now taken of the action of alcohol

* Medical Times, vol. xii, p. 320.

upon the blood and nervous system, it would appear as if its specific action on the latter is purely stimulant, owing "to some peculiar relation" existing between the spirit and nervous substance; and that its action upon the blood is, if we cannot say purely chemical, at least that it affects its chemical or chemico-vital properties in a marked degree, especially in hindering the due arterialization of the vital fluid, and that thus we have those symptoms developed which are due to the circulation of venous blood through the body, and especially through the nervous system at large. The cases of sudden death caused by the rapid ingestion of a large quantity of strong spirit, may be quite accounted for by the shock communicated directly by application to the brain itself, or indirectly by the gastric nerves and solar plexus, as in the case of death from a blow on the epigastrium. Death in the later stages of intoxication may be well accounted for by the state of venous plethora or cerebral congestion which is present. Some indication of the amount of vital injury which has been sustained by the patient in cases of extreme intoxication, may be gathered from the condition of the iris. Mr. Bedingfield has made the observation—"If the iris retain its contractile power the patient will generally recover, however overpowered the senses may be; if, on the contrary, it remain in a state of extreme dilatation when a strong light is directed upon it, only a feeble hope of recovery can be entertained."* In a case recently reported† of a child two and a half years of age, poisoned by alcohol, the pupils are mentioned as being at first fully dilated and insensible to any impression from light, but

* Thomson's Mat. Med.

† Medical Times, March 17th, 1849.

on the patient being placed in a bath, and bled, they are described as having made several ineffectual attempts at contraction, and then as shutting spasmodically. The child eventually recovered.

The powerful influence exerted by alcoholic stimulant upon the blood and nervous system, will, of course, prepare us to find its effects upon the muscles equally energetic. We have seen that the primary effect is that of nervous excitation, which, in the first place conveyed to the nervous centres, is at once reflected upon the muscular system, giving rise, doubtless, to the immediate increase of muscular energy which follows the ingestion of alcohol in almost any form. Probably, this increase of muscular and nervous power is connected with the fact elicited by the experiments of Pfaff and Arhens, that spirituous drinks increase the quantity of free electricity in the animal body.* If, however, a large proportion of spirit is taken, or even, if, after a smaller quantity, the individual remains quiet in the house, the increased energy, before long, gives way to a feeling of oppression and languor, and loss of muscular power; these effects, there can be little doubt, are owing to the diminished arterialization of the blood, and to the lessened elimination of carbonic acid by the lungs, as proved by Dr. Prout, but also from its preventing those changes in the tissues, which are, whilst productive of animal heat, at the same time necessary for the development of mechanical force.† The changes referred to are mainly the union of the carbon and hydrogen of the tissues with the oxygen conveyed to them in arterial blood; as the same elements, however, carbon and hydrogen, enter largely into the composition of alcohol,

* Müller's Physiology, p. 71.

† Liebig's Animal Chemistry.

and when introduced into the system in this form, have a stronger disposition to unite with oxygen than the similar elements existing in the tissues of the frame, of course in obedience to chemical laws, the tissues remain unchanged by the oxygen, as long as alcohol, or perhaps its elements in some form, are circulated with the blood. On this head Liebig remarks, "that the development of heat in the body, after the use of wine, increases rather than diminishes, without the manifestation of a corresponding amount of mechanical force." "Weariness, feebleness in the limbs, and drowsiness, plainly show that the force available for mechanical purposes, in other words, the change of matter, has been diminished."

This property, however, possessed by alcohol, of stopping or retarding the change of matter in the living system, renders it, as we shall see hereafter, our most valuable stimulant agent in states of great depression of the vital powers, as in the last stages of typhus: in these cases, as remarked by Dr. Carpenter, "There can be no doubt that the want of power to sustain the requisite temperature is the immediate cause of death; the whole combustible matter of the body having been exhausted, and the digestive apparatus not being able to supply what is required." The most efficient internal means for counteracting this condition of the system, "is, undoubtedly, the administration of alcoholic fluids," which, it is well known, are then capable of being taken in large quantity without stimulating unduly, "being burnt off as fast as taken in."* This power of alcohol, to take the place of the natural elements of respiration, is given by Liebig as the reason why the "carnivorous savage cannot withstand the action of brandy, which, acting as an element of respiration, puts a stop to the change of matter by

* Carpenter's Manual of Physiology, p. 68.

performing a function which properly belongs to the product of metamorphosed tissues." * The influence exerted by alcohol upon the blood and tissues, or at least the manifestation of that influence, is very much modified by external relations and circumstances: thus, the languor and weariness, produced by it, vary much, or are totally absent. When there is no mental or nervous excitement, they are much more apt to occur; and, also, when the nervous system is in a state of depression, alcohol may increase that depression and the muscular languor still more for a time, until the dose is increased. In such a case the nervous power had not been excited, and the chemico-vital effects had been produced. Further, in exhaustion from long-continued muscular exertion, a dose of *strong* spirit, instead of sustaining the fainting strength, may even extinguish what remains, by putting a stop to the change of tissue: diluted spirit would not have the same effect. When alcoholic fluid is taken by a healthy individual engaged in active exercise in the open air, especially if it be cold, its effects are much less obvious; the temporary increase of nervous and muscular energy is still experienced; but, provided the quantity taken has not been large, the languor and oppression felt by a person who remains quiet in-doors, after a similar dose, is not developed. This effect is, doubtless, due in great measure to the rapid using up and consequent change of tissue by the muscular exertion, but likewise to the more rapid circulation and respiration, by which, aided by a cold and pure air, a greatly-increased quantity of oxygen is introduced into the body, and the more rapid combustion of the superfluous carbon and hydrogen effected. On this head Dr. Guy, in his evidence given before the Health of Towns' Commission, having stated

* Liebig's Animal Chemistry, p. 179.

that, "men who work out-of-doors are more addicted to drinking, than those who are employed within-doors," assigns as a reason that "the man who has much exertion in the open air, is not so conscious of the effect of spirituous liquors as the man who leads a sedentary life within doors," nor does his occupation require so much thought, or so steady a hand as that of the artizan. Those who work hard, too, think that some kind of fermented liquor is absolutely necessary. Certainly, independent of muscular exertion and exposure to open air, the influence of an excited nervous system will do much to prevent what might be called the narcotic symptoms produced by alcohol; thus, a very powerful mental excitement such as joy, surprise, terror, will not only prevent these effects, but even dispel them after they have been established. Many instances are recorded of persons suddenly sobered by strong mental emotions. Further, under the gentle influence of social intercourse, and a pleasing flow of conversation, the narcotic effects of alcoholic liquor are not so readily manifested, being, doubtless, partly kept in abeyance by the counter-agency of the nervous excitation, and partly, also, by the greater activity with which all the functions go on under the influence of cheerful mental stimulus; and especially the respiratory function of discharging carbonic acid from the system; it having been proved by Dr. Prout that, under pleasurable mental excitement, the discharge of carbonic acid from the lungs is notably increased.

It is pretty certain that alcohol which has been taken into the stomach, pervades the muscular system generally; indeed, from its volatile properties, there can be little doubt that, independent of absorption and circulation, it would, soon after ingestion, permeate the tissues of the body generally, by endosmose. "Breschet, on opening the bodies of criminals, shortly

after their execution, observed, that in those addicted to drinking spirits, a strong odour of eau-de-vie exhaled from every part." It would appear, as if in that fearful and as yet unexplained affection, spontaneous combustion, in drinkers of ardent spirits, the great mass of the body was thoroughly impregnated with alcohol; but in what condition or combination, science has, as yet, been unable to discover; indeed, the whole subject is so enveloped in obscurity, that it would serve no good purpose to pursue it in the present treatise, further, than to notice it as a warning to victims abandoned to the miserable vice of habitual intoxication. That alcohol enters into intimate union with the gastric parietes, appears probable from an observation of Dr. Percy's, who found it impossible, by any ordinary means, to destroy the evidences of its presence in the substance of the stomach of an animal to which it had been administered. That the abuse of ardent spirits has some effect in hindering growth and development, generally in the animal body, is practically recognised in the case of dogs, to whom it is given for the purpose of stunting their growth; and, it is also said, to jockeys, for the same purpose. The fact seems to be supported by a curious observation made in France "In the department of Finisterre (Brittany) the use of ardent spirits seems to increase, and to be attended with some peculiar effects upon the population. In the two arrondissements of Quimper and Quimperlé, the spirituous liquors imported increased from 1869 hectalitres in 1825, to 3985 in 1839; and corresponding with this increase, the average stature of young persons subject to military service is said to have diminished until it had become 23 millimetres (about an inch) less in 1838 than 1818." *

* Lancet, 1842-43, vol. i, p. 308.

CHAPTER V.

ALCOHOL, ITS EFFECTS ON THE DIGESTIVE AND URINARY ORGANS, LUNGS AND SKIN, AND IN POISONOUS DOSES.

Alcoholic Fluids — Their Digestion, Dr. Paris, Orfila, Remarks — Coagulating Power — Injurious Effects on the Digestive Organs, Stomach, Liver, Dr. Budd, Andral, Dr. Prout—Effect of Heat, Dr. Parkes—Pancreas—Kidneys, Excretion, Liebig, &c., Dr. Percy—Bright's Disease, Dr. Christison, Dr. Prout—Respiratory Organs—Excretion of Carbon, MM. Bouchardat and Sandras—Excretion of Alcohol—Luminous Breath — Diseases, Dr. Guy, Dr. Mackintosh, Sir J. Clark—Skin—Poisonous Doses—Sudden Death—Coma, Dr. G. Bird, Duration—Pathology—Slow Poisoning—Offspring of Drunkards, Burton, Dr. Darwin, &c.—Value of Temperance.

We have seen that when alcohol in any of its ordinary forms is introduced into the healthy stomach, its first effect is excitement of the extremities of the nerves distributed to the viscus, and thence, of its various nervous connexions, this being shortly succeeded by increased vascularity, as observed by Dr. Beaumont in the case of St. Martin, and as concluded to be the case from the appearances presented by the stomach on post-mortem examination after alcohol had been administered to animals, or inordinately consumed by men; the effect varying with the strength of the fluid, but present, more or less, in all cases, as indeed might naturally be concluded, seeing that even during the healthy digestion of plain unstimulating food, there is increased vascularity of the mucous membrane; this was particularly observed in St. Martin. "The moment the food came into contact with the villous coat the action of the neighbouring blood-vessels increased, and their branches

dilated so as to admit the red blood much more freely than before. The colour of the membrane consequently changed from a pale pink to a deep red."* These effects were much increased by the use of stimuli.

With respect to the digestion, if we may call it so, of alcoholic fluids, and their action upon the contents of the stomach, that is upon the gastric juice, and the digesting mass of food, different accounts have been given. Dr. Paris says of wine and fermented liquors, that the " alcohol they contain coagulates a portion of the gastric juice, and this residue, together with the extractive matter, gum, resin, and other principles which the liquid may contain is then digested. Under certain circumstances these liquids may observe a different law of decomposition, which, perhaps, in some measure explains the different effects which such potations will produce; for example, the spirit may undergo a partial change in the stomach, and be even digested with the solid matter, or on some occasions be converted into an acid by a fermentative process; this will be more likely to occur in vinous liquors which contain ingredients favorable to the production of such a change; and hence the deleterious property of fermented liquors does not bear an unvarying relation to the absolute quantity of alcohol."† According to Orfila, if a *large* quantity of alcohol be taken during, or shortly after a meal, it coagulates the albuminous portion of the contents of the stomach, and this coagulated albumen passes off almost unchanged into the small intestines. The action of the gastric juice upon other portions of the food is prevented, and they undergo

* Combe's Digestion, p. 39.

† Cycloped. Pract. Med., art. Diet.

acetous fermentation. A large quantity of pure alcohol, also, reaches the duodenum, mixes with the bile, which loses its alkalescence. With respect to the observations of Dr. Paris, it may be remarked that the fact of the absolute digestion of alcohol is questioned by many, who contend that the spirit passes into the circulation unchanged, and is decomposed in the blood. The observations of Orfila are evidently upon the effect of a *large* dose of alcohol, and are, perhaps, scarce applicable to the ordinary effects upon digestion which follow the use, at least, of wine or fermented liquors as generally employed.

Although alcohol possesses the power, more or less, of coagulating various principles which it usually meets with in the stomach, the gastric juice also exerts the same effect " on all the fluid forms of albumen, whether existing in the serum of the blood or the white of the egg, or in different secretions, more especially milk. The object of this coagulation appears to be to detain the substance for a longer time in the stomach, and subject it more completely to the solvent power of the same fluid, by previously acquiring a solid form, which prevents its escape by the pylorus."* Although, therefore, " albumen is immediately coagulated by alcohol unless very much diluted," still gastric juice coagulates it also, and probably it is not rendered more indigestible by one coagulation than the other, if as much so; for whilst we find that in the coagulation of caseine caused by rennet the curd is insoluble in water, it is soluble in that fluid when the coagulum is caused by alcohol.† With respect to the influence of alcoholic fluids upon gelatinous

* Roget's Physiology.

† Müller's Physiology, p. 547.

principles, although "gelatine is insoluble in alcohol, when already in solution in water, it is not precipitated by the former fluid."* Probably, therefore, in those cases in which the ingestion of alcoholic fluids really interferes with the digestion of the food, it is not owing to their action upon the food mass, so much as to their interference with the secretion of the gastric juice when they are used immoderately, or even moderately, but without due occasion, or in unsuitable states of the stomach or system. The disorder of digestion from the use of alcoholic fluid, may not extend beyond the digestion of the meal at which it has been taken, but if the use be improperly or immoderately continued, disorder of the stomach, functional or organic, will be the probable result, such as has already been described in the case of St. Martin, and the disordered condition of the stomach may, as there shown, exist without exciting any very marked constitutional or local symptom. When an individual has surrendered himself to the dominion of the regular habit of intemperance, particularly in the use of ardent spirits, he becomes liable to the most serious organic lesions of the digestive organ, resulting from the state of irritation or sub-acute inflammation in which it is continually maintained. Hemorrhage is extremely common. Dr. Latham, in his 'Lectures on Diseases of the Heart,' says that journeymen tailors, as a class, have furnished him "with more cases of profuse hemorrhage from the stomach and bowels than any other,"† and attributes this to the habit of spirit drinking which is carried on by them to a most horrible extent.

From the close connexion existing between the stomach

* Roget's Physiology, vol. i, p. 293.

† Vol. i, p. 353.

and liver, in function, situation, and vascular communication, the latter becomes quickly influenced by the presence of alcoholic liquid in the former; indeed, there is no doubt that the fluid passes direct from one to the other. Dr. Percy was able to separate alcohol from the bile, and also from the substance of the liver itself. The effect of this passage of alcohol direct to the gland may prove serviceable in cases of great torpidity or deficient biliary secretion. The continued improper use, or abuse of stimulants, is, however, almost certain to induce liver disease, especially that form of it named cirrhosis, which consists in an adhesive inflammation in the areolar tissue about the small twigs of the portal vein; indeed, the only cause of the disease, "whose influence is apparent in this country, is spirit drinking;" the disease is consequently "most frequent in large manufacturing towns, among the poorer classes, many of whom spend great part of their earnings in gin; and for this reason the granular and hob-nailed liver, known to the French as cirrhosis, has been familiarly termed by English practitioners the gin-drinker's liver." "The influence of spirit drinking in producing this disease has also been observed in France. Andral states that in most of the cases of cirrhosis that he has recorded, the patients had drunk spirits to excess."* This affection of the liver may be produced in an individual otherwise healthy, by the abuse of alcoholic fluids; but when other disease, such as that of the heart, exists, by which the circulation is at all impeded, the tendency to its occurrence is much greater. According to Becquerel, "obstructed circulation through the lungs and heart favour the action of alcohol in producing cirrhosis;"

* Budd on Diseases of the Liver, p. 116.

and Dr. Budd says: "Although disease of the heart may not directly lead to inflammation of the liver, it may yet, by causing a stagnation of blood in the vessels of the liver, give greater effect to spirits, or any other deleterious agent, absorbed from the intestinal canal." In another form of liver disease, the fatty liver, alcoholic fluids are injurious, not from their stimulant, but from their chemico-vital effects. In fatty liver, the result of "gross feeding and indolent habits," the fat may be got rid of by adopting a different mode of life. "Abstinence from sugar and its chemical equivalents, is a point of great importance. As sugar furnishes a material for respiration, which is soluble in the blood, it is acted upon by oxygen much more readily than the insoluble fat, which is thus protected, and laid up in the system. Alcohol has a still stronger protecting power for similar reasons."* With respect to another affection connected with the liver—gall stones—Dr. Prout has remarked, "that a tendency to the formation of gall-stones of cholesterine is frequently associated with a tendency to lithic-acid deposits in the urine,"† and ascribes both affections to the free use of porter, particularly in London. The same remark may apply to drinkers of ale equally as well. When speaking of the effects of atmospheric temperature in increasing or diminishing the effects of alcohol upon the system, it was noticed with how much greater facility its elements are removed from the system in a cold climate than in a hot one; hence the very injurious effects exerted upon the liver by the use or abuse of alcoholic fluids under exposure to great heat. "The remarkable influence of the abridgement of the quantity

* Budd on Diseases of the Liver, p. 244.

† Ibid., p. 282.

of alcoholic fluids, in diminishing the occurrence of liver complaint in India, is strikingly exhibited in the following return from the Cameronian Regiment in Bengal:"

Consumption of Spirits:

1832, 1833, 1834 } 10,000 to 14,000 gallons.

1837, 1838 } 2000 to 3000 gallons.

The mean of the three years when the large quantity of spirits was used is 128 cases of liver disease; while in the two years of temperance, the mean number of cases is 66, or about one half. The effect of diminishing alcoholic consumption upon the troops in Bengal is clearly proved by the following table:

1838.	Temperance Society.	Remainder of Regiment.	Sick, per cent. Society.	Sick, per cent. Remainder of Regiment.
January .	1953	2569	2·54	8·15
February	1840	2639	2·27	8·27
March .	1542	2879	2·94	8·66
April .	1359	3081	5·47	10·28
May .	1282	3161	5·24	10·66
June .	1364*	3065	4·55	10·35

The above was the effect produced merely by reducing the quantity of spirits consumed.† With respect to the influence of temperature in modifying the effects of alcohol upon the

* The above numbers are the gallons of spirit consumed.

† Lancet, 1840-41, vol. ii, p. 557; Dr. R. D. Thomson.

system, Dr. Budd says, "In cold countries people may drink with impunity, perhaps with benefit, quantities of spirit that would prove very injurious in hot ones. It has been remarked that our troops stationed in Nova Scotia and New Brunswick (where, from the low price of spirits, there is much intemperance), suffer less from diseases of the liver than those at home. In hot countries, hard drinking seldom fails to bring on disease of the liver. Baron Larrey, in his account of the health of the troops in Napoleon's campaign in Egypt, says that wine and fermented liquors produce the most baneful effects in that country, and remarks it as a wise law of the Koran that forbids their use."*

Dr. Parkes remarks, "When the diet is unstimulating, moderate, and devoid of alcoholic liquids, I have never in myself or in any other person (in India) seen any increase of the biliary secretions."† Indeed, writers generally on the diseases of tropical climates most unequivocally condemn the regular use of alcohol in any form, and attribute, and justly, much of the high rate of mortality among Europeans to their use and abuse. In this country, even those who may use with benefit a small quantity of stimulant daily, would do well to pay attention to the different temperature at different seasons, and regulate their consumption accordingly. The same wine or malt liquor which in winter was taken only with benefit, may, if continued during summer heat, give rise to biliary derangement, and prove one source amid others of those sudden and painful discharges of bile, which constitute the disease known as British or bilious cholera. We know but little of

* Budd on Diseases of the Liver, p. 119.

† Remarks on Dysentery, p. 133.

the influence of alcohol upon the pancreas, but we have every reason to think that in the intemperate it must share in the general injury. In one case, Dr. Percy found part of the gland "much congested, and in the same part also there was bloody extravasation under the serous membrane and between the lobules."

Although not known to be in as direct communication with the stomach as the liver is, the kidneys are scarcely less liable to be influenced by alcohol when taken in any form. When, however, the spirit is taken largely diluted, the almost certain effect is diuretic, more or less, according to the nature of the fluid, as for instance gin, which acts more powerfully from its impregnation with turpentine or juniper; if the spirit, however, is taken undiluted, the diuretic action is less likely to be manifested. Generally speaking, alcohol does not pass off by the kidneys; indeed, until lately it was thought never to do so. Berzelius denied that it did, so likewise has Müller, and Liebig even says, "According to all the observations hitherto made, neither the expired air, nor the perspiration, nor the urine, contains any trace of alcohol after indulgence in spirituous liquors."* That the assertion respecting expired air is incorrect we shall see hereafter; it is also erroneous as regards the urine. Dr. Percy succeeded not only in separating it from the urine of a dog poisoned by alcohol, but also from that of a man guilty of habitual intoxication. Beyond diuresis, it is seldom that alcohol exerts any *immediate* appreciable effect upon the kidney. Liebig says† that "the use of wine and fat, which are only so far altered in the organism that they combine with

* Animal Chemistry, p. 239.

† Ibid., p. 139.

oxygen, has a marked influence on the formation of uric acid. The urine, after fat food has been taken, is turbid, and deposits crystals of uric acid (Prout). The same thing is observed after the use of wines, in which the alkali necessary to retain the uric acid in solution is wanting." The same is observable after the use of acid malt liquors; but of course these effects are due more to the accompanying matters than to the alcohol. One of the most frequent forms of renal disease, caused by the abuse of alcoholic drinks, is the granulated; Dr. Christison states that at least three fourths of the cases of this disease in Edinburgh are traceable to the above cause. Dr. Prout gives a similar testimony, and says, when the anæmotrophied form "is once fairly established in early life, especially by the abuse of ardent spirits, the individual rarely survives the middle age. Drinkers are more particularly liable, especially as life advances, to affections of the bladder and its connexions."

Some notice has already been taken of the influence of alcohol upon the respiratory functions; these, as we have seen, are, undoubtedly, much affected by the presence of the spirit in the circulation, the amount of carbon eliminated, as proved by Dr. Prout, being much decreased soon after alcohol has been taken, though, after a time, the excretion of carbonic acid appears to rise much above the natural standard. Of course whatever augments the amount of oxygen taken in by the lungs, must facilitate the combustion and excretion of the alcoholic components, carbon and hydrogen; and thus we find, that exercise, by quickening the respiration, and cold air, by affording a greater concentration of the atmospheric oxygen, both tend to prevent or diminish the effects of the spirit on the system.

Hasse, in his 'Pathological Anatomy,' makes the observation, that in persons habituated to the use of alcoholic stimulants, the respiration is habitually slower than in other persons, and that, in delirium tremens especially, this diminution in the frequency of respiration is most remarkable."* However certain it was, that the lungs were the organs by which the system was principally freed from the elements of alcohol; it is not long since it was actually proved by experiment, that the spirit itself is, really, though in small quantity, given off. MM. Bouchardat and Sandras proved this, by directing the gases and vapours evolved, during respiration, by a man who had taken a considerable dose of alcohol, through a Woulff's bottle surrounded by a freezing mixture. After the operation had been conducted for two hours, only a minute quantity of alcohol was found in the condensed fluid.† In habitual drunkards, such as those whose systems seem to be supersaturated with alcohol, it seems to pass off, in some rare cases, in a peculiar form, probably, somewhat similar to that which originates the process of spontaneous combustion. The breath is luminous. A case of this kind is reported to have occurred in the West Derby Poor-house, Liverpool. The man, a drunkard, was suffering from hemorrhage from the bowels, &c. "About twenty minutes before death, the nurses observed a red-hot coal-like streak on the mouth, playing on the right cheek and upper lip, and continuing till death took place. The flame was persistent with the breath of expiration, and not at all lambent."‡ Dr. Marc has recorded the case

* Ranking's Abstract, vol. viii, p. 42.

† Annales de Chimie et de Physique. Monthly Retrospect, p. 5.

‡ Medical Times, vol. xi, p. 326.

of a shepherd, who, during his last illness, eructed inflammable gas which smelt strongly of alcohol.*

There can be no question, that diseases of the lungs, both acute and chronic, are frequently the result of the abuse of alcoholic liquors. Dr. Mackintosh† stated, that among the British soldiery during the war, pneumonia of a very fatal character frequently occurred from this cause, particularly when combined with cold. But perhaps consumption is the disease most likely to be engendered. Dr. Guy, in his evidence before the Commission, says, that one cause of this affection, "over which the poor themselves can exercise control, is the abuse of spirituous liquors." And Sir James Clark also remarks as follows: "We believe that the abuse of spirituous liquors among the lower classes in this country, is productive of tuberculous disease to an extent far beyond what is usually imagined. Indeed, it is only necessary to observe the blanched cadaverous aspect of the spirit-drinker to be assured of the condition of his internal organs. The tale of his moral and physical degradation is indelibly written on his countenance."‡ Although it is not recorded that alcohol has been detected in the perspiration, there is no reason why it should not at times pass off by this channel, for as carbonic acid is thrown off by the skin, the elements of the spirit doubtless pass thus as well as by the lungs; certain it is, that individuals who are engaged in employment which causes profuse perspiration, can drink very largely without becoming inebriated. Many stokers drink immense quantities of beer. Spirits at times act well as dia-

* Thomson's Mat. Med., p. 207.

† Elements of Pathology, vol. i.

‡ Cycloped. Pract. Med., vol. iv, p. 321.

phoretics; and in some, gin acts thus, and not at all on the kidneys.

POISONOUS DOSES.

We have, hitherto, been considering what may be said to be the effects of a moderate quantity of alcohol; it is necessary for us now to notice its effect as a poisonous dose. Alcohol is usually ranked by toxicologists among the narcotico-acrid poisons. Its primary effect is irritant. If a large quantity of strong spirit or alcohol be quickly swallowed or injected into the stomach, it may cause immediate death. Many cases of this kind are on record, and are frequently noticed in the public prints. Dr. Percy found, in one of his experiments, the effect almost instantaneous.

If death does not immediately ensue, total insensibility generally supervenes, lasting for a longer or shorter time; either terminating in recovery, or passing into apoplectic coma. The cause of the sudden extinction of life by a large dose of strong spirit, is generally attributed to the shock communicated to the system, consequent upon the impression upon the extensive nervous connexions of the stomach, and considered similar to sudden death caused by a blow on the epigastrium, or by a draught of cold water in a heated and exhausted individual. As we have seen, however, the very rapid transmission of the spirit to the brain itself renders a positive decision on the subject difficult. Dr. Golding Bird has related* a case of this instantaneous effect of alcohol in a healthy temperate man, who being employed in a distillery, drank one day by mistake about

* Lancet, vol. i, 1839-40, p. 166.

half a pint of alcohol 50° above proof. Total, immediate, insensibility was the consequence, which continued for eleven hours. Recovery took place, followed, however, as seems commonly the case, by injury to the general health. Should the nervous shock produced by alcohol not prove immediately destructive to life, danger is next threatened by the rapid absorption of the spirit into the system; the individual, after the usual symptoms of intoxication, becomes insensible or comatose; face flushed and vessels distended, pupils contracted, surface hot; or contrasting with violent throbbing action of the heart and arteries, the face deadly pale, lips blue, pupils dilated, surface cold and covered with clammy sweat; the natural tonicity of the muscles suspended, so that the jaw drops; in short, every appearance of death, which indeed may speedily take place: even from this apparently hopeless state, nevertheless, a patient may be roused by appropriate measures. It ought to be remembered, however, that sensibility may be restored, and the accompanying symptoms dispelled, and yet, especially if the stomach have not been entirely emptied, they may again return and prove fatal. As has already been remarked, Mr. Bedingfield, in directing attention to the state of the iris in these cases, says, that if it remain in a state of extreme dilatation when a strong light is directed upon it, only a feeble hope of recovery can be entertained. Recovery is generally preceded by heavy sleep, and there is sickness and vomiting. "The ordinary duration of fatal cases of poisoning by alcohol, is said to be from twelve to eighteen hours; but this can only be regarded as a proximate statement, since there are not many accurate reports of cases of this description, and among these there is considerable variation, both as to the time of death, and the quantity of

spirit taken."* Dr. Percy, in the case of dogs, found death usually occur in the course of two or three hours.

The post-mortem appearances after poisoning by alcohol must necessarily vary according to the time life has been prolonged. If death occur quickly, the smell of alcohol will be perceptible in the stomach, and also in other parts of the body; even, according to Dr. Christison, in the pericardium. As we have seen, chemical examination has demonstrated its actual presence in the brain and elsewhere. Except, however, in the bodies of habitual drunkards, as reported by Breschet, if life continue for some time, all trace of spirituous odour in the tissues and cavities of the body will entirely disappear. After poisoning by strong spirit the stomach is generally inflamed, the mucous membrane being found either of a diffused bright red colour, or dark brown, or with highly injected patches: a case has been already quoted in which a pint of spirits proved fatal in eight hours, and black extravasation was found on the mucous lining. The brain, as might be expected, is found more or less congested, blood at times effused, and serous effusion in the ventricles, yielding alcohol by distillation. The lungs are found congested.

The rapid poisoning by a dose of strong alcohol is strikingly evident to all; but far more common, far more generally fatal, is the insidious poisoning of the whole springs of life by the regular abuse or unnecessary use of the agent: functional derangements and organic changes surely follow. There can be no doubt that habitual, or even occasional, intoxication, renders the system less able to resist attacks of epidemic disease. The drunkard is the first to fall, the first to sink.

* Taylor's Medical Jurisprudence.

The fact is too well known to require illustration; the records of every fever hospital give it witness. During the actual excitement of intoxication, it is probable that the system is not more subject, if as much so, to be affected by morbific influences as at another time; at least it is certain, that persons in a state of extreme inebriety have been known to lie all night exposed to cold, &c., without suffering those bad effects which in their ordinary state they must inevitably have done: it is during the state of subsequent collapse that the susceptibility exists. "Three butchers who visited a tavern, abandoned themselves to every species of excess, and drank till they were intoxicated, so that they were carried home senseless; a few hours scarcely elapsed, when the miserable men were seized with every symptom of cholera, which advanced with such rapidity as to prove fatal to the whole three within four hours."* This incident happened in Paris during the prevalence of cholera in 1831-32. Facts illustrative of the production of chronic disease by intemperance have been fully adduced in preceding pages. Dr. Latham furnishes an apt conclusion, "In a multitude of cases where the lining membrane of the heart and arteries has been beset with cartilaginous or atheromatous or earthy deposits, the patients have been habitual spirit drinkers for years, and the most conspicuous conditions antecedently presented by them, have been the failure of many functions, and the growth of structural disease in many organs, especially in those subservient to nutrition."†

The offspring of drunkards are very likely to prove diseased, and what is more, are apt to inherit a tendency towards the

* Lancet.

† Lectures on Diseases of the Heart, p. 125.

vice of the parent. Burton, in his 'Anatomy of Melancholy,' remarks—"If a drunken man gets a child, it will never likely have a good brain:" and Dr. Darwin made the observation—"It is remarkable that all the diseases from drinking spirituous or fermented liquors are liable to become hereditary, even to the third generation, gradually increasing, if the cause be continued, till the family becomes extinct." This, if not strictly correct, is in great measure so. Sir James Clark says of the drunkard, "he not only destroys his own health, but entails on his unfortunate offspring the sure disposition to tuberculous disease."*

This chapter cannot be better concluded than with an extract from the 'Journal of Public Health' for August 1848, showing the value of temperance in preserving health and life. It is there stated that "the usual rate of mortality among healthy persons in the prime of life, may be taken at 10 per 1000 annually. Among agricultural labourers, according to Mr. Neison's tables, the rate is lowest, being, at the age of 44, only 8 per 1000. Amongst clerks at the same age, it is no less than 23 per 1000. But the annual mortality in the Temperance Provident Society, during seven years, has averaged only 4 per 1000." Were these selected lives?

* Cycloped. Pract. Med., art. Phthisis.

CHAPTER VI.

CORPOREAL EFFECTS OF VARIOUS MODIFICATIONS OF ALCOHOLIC LIQUORS.

Spirits of Wine, Difference in Action, &c., Dr. Paris, Donovan, Fabroni—Feather-white Wine, Liebig—Sparkling Wines—Light Wines—Strong Wines—Acids in Wine—British Wines—Malt Liquors—Lithic Acid.

The effects of alcohol upon the system are very different when it is taken in the form of ardent spirit, from what they are when it is consumed in combination with saccharine, extractive, and other matters, as it is in wine and malt liquor. Indeed, the difference is so great, that, until it was disproved by distillation in vacuo, many considered the separation of the spirit from the wine to be an educt of the distillation by heat. It is certain that ardent spirits exert a much more irritating effect upon the nervous system, both topically in the stomach and at large, than the fermented liquors. On this head Dr. Paris says, "Daily experience convinces us that the same quantity of alcohol applied to the stomach under the form of wine, and in a state of mixture with water, will produce very different effects upon the body, and to an extent which it is difficult to understand. It has, for instance, been demonstrated beyond the reach of doubt, that port, madeira, and sherry contain from one fourth to one fifth of their bulk of alcohol; so that a person who takes a bottle of any one of them will thus take nearly half a pint of alcohol, or nearly a pint of pure brandy! And, moreover, that different wines, although con-

taining the same absolute proportion of spirit, will be found to vary very considerably in their intoxicating powers." Dr. Paris accounts for this by the supposition that in wine, alcohol " is not only more intimately mixed with water, but that it exists in combination with its extractive matter; in consequence of which it is incapable of exerting its full effects before it becomes altered in its properties, or, in other words, partially digested; and this view of the subject may be fairly urged in explanation of the fact, that the intoxicating effects of the same wine are liable to vary in degree in the same individual, from the peculiar state of his digestive organs at the time of his potation." With some persons, a little dilute spirit agrees better than any wine, and Dr. Paris says that when dietetically taken it ought to be mixed with the water at least twelve hours before use, to insure intimate combination. Donovan remarks, " wine intoxicates less effectually than the quantity of brandy which it would afford on distillation; and for this reason, that the brandy is held in chemical combination, and its qualities are modified by the other combined substances. That the alcohol is thus retained in chemical combination with other matter by a somewhat energetic affinity, appears by the experiments of Fabroni, who found that if he added ever so small a quantity of brandy to wine, and then mixed with it a large portion of subcarbonate of potash, the brandy was thrown up to the surface, where it formed a floating stratum. But if he did not add brandy, the addition of potash occasioned no appearance of separation of brandy natural to the wine, it being held combined with the other ingredients."* The

* Donovan, p. 285.

alcohol of old wines being " retained by a stronger affinity, they exert a less degree of action on the nervous system."

In addition to the influence of the alcohol, the effects of different wines are much modified by the various saccharine, mucilaginous, acid, and other constituents which they contain. Liebig mentions that in Germany, fatal accidents " frequently occur in wine countries from the drinking of what is called the feather-white wine." This poisonous wine, is wine still in a state of fermentation, which is increased by the heat of the stomach. The carbonic acid gas which is disengaged penetrates through the parietes of the stomach, through the diaphragm, and through all the intervening membranes into the air cells of the lungs, out of which it displaces the atmospheric air. The patient dies with all the symptoms of asphyxia caused by an irrespirable gas; and the surest proof of the presence of the carbonic acid in the lungs is the fact that the inhalation of ammonia (which combines with it) is recognised as the best antidote against this kind of poisoning." It is worthy of remark, that the same effects are not found to follow the use of the fermenting sweet wort from a brewer's vat. Persons employed about breweries are frequently in the habit of drinking this for the sake of its aperient qualities, and do so without any apparent bad effects ensuing of the nature described by Liebig.

Those wines, however, in which fermentation is not quite completed, and which contain free carbonic acid, certainly exert injurious effects upon some constitutions, especially where there is any tendency to asthmatic or similar affections. That this is due solely to the carbonic acid is evident from the fact, that soda water is apt equally to cause inconvenience.

Dr. Thomson says* that the brisk and sparkling wines affect the nervous system very rapidly, and intoxicate sooner than dry wines which contain a much larger proportion of alcohol, from the spirit being intimately combined with the carbonic acid and rising with that gas, so that the alcohol of the wine is thus more directly applied to the nerves of the stomach, and in a form peculiarly well calculated to make a powerful impression upon them. It is probable that what are called the light wines, especially those of France, are least likely to exert injurious effects upon the system, owing, no doubt, to their containing a comparatively small amount of alcohol, and being free from its artificial introduction, which a morbid taste has rendered necessary for the sale of the stronger wines of Spain and Portugal in this country. "The light wines of the Rhine and of the Bordelais are certainly much less likely to influence, injuriously, the nervous system than any others. They are less intoxicating, and generally possess diuretic properties. Those of the Rhine, also, although acidulous to the taste, are less likely to ferment on the stomach than stronger wines; both because the acid which they contain is the tartaric, and also because their alcohol is more intimately combined with the other principles of the wine."†

The opinion is gaining ground with the public, as it has long done with medical men, that the regular use of the strong dry wines is very frequently injurious, as "much of their potency arises from uncombined brandy mixed with them," and "the large quantity of tannin and gallic acid which they contain renders them hurtful as a daily beverage." Further, Dr. Thomson

* Mat. Med., p. 211.

† Ibid., p. 212.

remarks, " from the nature and quantity of their volatile oil, they affect the brain in the same manner as narcotics; not exhilarating and enlivening the fancy, except in the very outset of their influence, but producing a sluggish state of the system, and evident tendency to apoplexy."*

Those, however, who have been accustomed to the use of these strong wines, can scarcely take the lighter kinds, or even a diluted wine. " It is a fact not easily explained, that the stomach is frequently outraged by a wine to which it has not been accustomed; and it is equally true that a mixture of wines is a common source of indigestion. The custom of mixing wine with water has its advantages as well as its evils. By dilution it frequently proves too little stimulant to the stomach, and runs into a state of acescency."† Dr. Prout says, " Individuals who have been long accustomed to the use of the strong brandied wines generally employed in this country, are almost sure to bring on attacks of pain in the back, and gravel, by the occasional use of weak acescent wines, such as the inferior hocks, champagnes, etc., particularly in cold climates, and if they are gouty and subject to urinary deposits. On the other hand, individuals who have all their lives been accustomed to the use of such weak wines, and to the free use of cider or of perry, rarely suffer from gravel."‡ Further, the same author remarks—" The strong and sweet wines, which by keeping usually become more or less acid, act very similarly to malt liquors, while the drier species, even when acescent, though they may act unfavorably on some

* Mat. Med., p. 212.

† Paris, Cycloped. Pract. Med., art. Diet.

‡ Stomach and Renal Diseases, p. 210.

individuals, are certainly, on the whole, much less liable to produce lithic acid deposits than might be expected. In such cases, perhaps, a good deal depends on the nature of the acid existing in the liquors; I have reason to believe that the lactic, acetic, and oxalic acids, act much more unfavorably on the stomach than the malic, tartaric, or citric acids."* Home-made British wines frequently owe their unwholesome character to the presence of some of the first-mentioned acids, and to their state of incomplete fermentation.

With respect to malt liquors, their amount of alcohol is generally small, in the strongest ales not exceeding from seven to nine per cent., in the lighter kinds ranging from four to seven per cent. The pale or India ale from various breweries, according to Dr. Ure's analysis, contains on an average six per cent. of alcohol. The heavy sweet ales, however, contain much sugar, the fermentation of which has been stopped, and also dextrine and extractive matter; on this account they are very apt to disagree, which is not generally the case with the lighter descriptions of malt liquor, especially such as are well hopped.

Many individuals whose stomachs will not bear the ales can take porter without suffering the same bad effects. The high drying and torrefaction of the malt apparently preventing the formation of the injurious agent. All descriptions, however, of malt liquor, are extremely apt in some constitutions to produce urinary derangement. Dr. Prout says, "It may be observed generally, that malt liquors, particularly when both sweet and acescent, rank among the most powerful in pro-

* Stomach and Renal Diseases, p. 200.

ducing lithic acid deposits." This tendency is increased very greatly, however, when malt liquor becomes acid or hard, and the fact is often exemplified in the case of brewery labourers, who frequently drink considerable quantities of hard ale which has been returned: these men are very apt to suffer from lithic acid deposit. Very new malt liquor, likewise, exerts injurious effects upon the urinary organs; the author has known a whole band of reapers to be affected with strangury, in consequence of drinking weak imperfectly-fermented beer, which had been brewed in a hurry for the harvest.

Independent of the natural ingredients, hurtful or otherwise, in alcoholic drinks, there can be no doubt but their effects upon the stomach and system are frequently much modified by adulterations, either accidental or intentional. Thus we have rum, containing either lead or copper, contracted in the distillation; wines containing lead, introduced for the purpose of sweetening, or sometimes other accidental impurities. A case is recorded of poisoning by arsenic which had become dissolved out of some shot corns accidentally left in a wine-bottle. Dr. Ure asserts that the best London porter always contains opium; perhaps this may account for the fact mentioned by Dr. Gregory "of two instances of persons attacked with urticaria after drinking porter;"* opium certainly will have such an effect in certain constitutions.

* Wilson on Skin Diseases, p. 149.

CHAPTER VII.

MENTAL EFFECTS OF ALCOHOL.

Brain and Mind — Sympathy—Alcohol, Effect on Mental Manifestations, Dr. A. T. Thomson, M'Neish—Phenomena of Intoxication—Consequences—Temperament — Temporary Insanity—Incitement to Crime, M. Quetelet, Eminent Judges—Permanent Insanity, Dr. Robinson—Statistics, Dr. Joseph Williams — Dipso-Mania, Sir A. Morrison — Withdrawal of Stimulant, Caution.

WITHOUT touching upon that wide field for investigation and controversy, the peculiar connexion existing between the brain and the mental manifestations of man, it is sufficient for our present inquiry if it be generally admitted, that upon the sound condition of that organ depends the vigorous and healthy exercise of man's mental powers, and vice versâ. Nothing can be more certain than the fact, that whatever disorders the physical constitution of the brain, is liable to disorder, more or less, or totally to extinguish, the ordinary mental functions. After the account given in a former chapter respecting the physiological action exerted by alcohol upon the central organ of the nervous system, we may be prepared to find it greatly affecting the manifestation of its powers.

It is well ascertained that the brain, and consequently the mind, is liable to be disordered by sympathy with other organs, at least by what we call sympathy, for want of a better explanation. Thus, in females, uterine disorder and mental disorder are often most intimately connected. In some cases of disease, retention of urine will cause peculiar delirium. Dr. Latham,

in his 'Lectures on Diseases of the Heart,' gives some most striking examples of disordered cerebral action sympathetic with cardiac disease. The primary action of alcohol, taken into the stomach, upon the brain, may be called sympathetic, although the rapid absorption of the spirit in some cases, renders it difficult to say how much is owing to sympathetic, and how much to direct action upon the organ.

That other agents besides alcohol do affect the brain and mind, by application to the extremities of the gastric nerves, is undoubted; for example, the presence of indigestible food in the stomach will occasion clouded intellect and low spirits; a mustard emetic has been known to cause inebriation; a dose of magnesia may give rise to headache, and consequent diminished mental energy, both of which may be quickly relieved by a little ginger or brandy. Probably, then, the first excitant action of alcohol upon the brain and mind is by nervous communication, although this quickly becomes merged in the further action of the spirit upon the brain itself.

The first effect of alcoholic stimulus upon the brain is to most men pleasurable. As described by Dr. A. T. Thomson, the impression upon the gastric nerves "is conveyed to the brain, spinal marrow, and entire nervous system; ideas of unusual brilliancy pass through the mind; there is, as it has been beautifully expressed, a soft tumult of the soul; fancy is awakened, and creates, from uninterrupted associations, new combinations and a world of its own, and it is at this moment, between sobriety and intoxication, that the poet sometimes pours forth his sublimest conceptions and most harmonious strains."*

* Mat. Med., p. 205.

M'Neish, in his 'Anatomy of Drunkenness,' has given a most elaborate description of the effects of the successive stages of intoxication upon the mind, beginning his description, however, not with the effect of the first slight excitement, but with that of incipient intoxication. He says, "First, an unusual serenity prevails over the mind, and the soul of the votary is filled with a placid satisfaction. By degrees he is sensible of a soft and not unmusical humming in his ears, at every pause of the conversation. He seems to himself to wear his head lighter than usual upon his shoulders. Then a species of obscurity, thinner than the finest mist, passes before his eyes, and makes him see objects rather indistinctly. The lights begin to dance and appear double. A gaiety and warmth are felt at the same time about the heart. The imagination is expanded and filled with a thousand delightful images. He becomes loquacious, and pours forth in enthusiastic language the thoughts which are born as it were within him. Now comes a spirit of universal contentment with himself and all the world. He thinks no more of misery: it is dissolved in the bliss of the moment. This is the acme of the fit—the ecstasy is now perfect. As yet the sensorium is in tolerable order: it is only shaken, but the capability of thinking with accuracy still remains. About this time the drunkard pours out all the secrets of his soul. His qualities, good or bad, come forth without reserve; and now, if at any time, the human heart may be seen into. In a short time he is seized with a most inordinate propensity to talk nonsense, though he is perfectly conscious of doing so. He also commits many foolish things, knowing them to be foolish. The power of volition, that faculty which keeps the

will subordinate to the judgment, seems totally weakened." "At first the intoxication partakes of sentiment, but latterly it becomes merely animal."

"After this the scene thickens. The drunkard's imagination gets disordered with the most grotesque conceptions. Instead of moderating his drink, he pours it down more rapidly than ever: glass follows glass with reckless energy. His head becomes perfectly giddy. The candles burn blue, or green, or yellow, and where there are perhaps only three on the table he sees a dozen. According to his temperament, he is amorous, or musical, or quarrelsome." "The muscular powers are all along much affected; this indeed happens before any great change takes place in the mind, and goes on progressively increasing." "He is, however, not always sensible of any deficiency in this respect: and while exciting mirth by his eccentric motions, imagines that he walks with the most perfect steadiness." "The last stage of intoxication is total insensibility" with profound sleep. "The individual does not awake in his usual state; his thoughts are gloomy, his temper irascible, and if the moral principle be not blunted by the frequent repetition of this vice, his mind is overpowered with the most distressing sense of degradation." The action of alcoholic stimulus upon the mind, is, however, by no means uniform. In some men, a single glass of wine, instead of exciting, seems to produce a state of depression and low spirits, which, by increasing the stimulus, may pass into excitement, but also may end in mental depression and slight stupor. This effect of alcohol is frequently due to deranged states of the general health; but something also is owing to temperament, which certainly exerts much modifying influence

over the effects of alcohol upon man's mental conditions. Thus, purely sanguine people become excited, "prone to combativeness and sensuality, and are either very good-natured or extremely quarrelsome."* Though some of a melancholic temperament may get excited, others do not; "on the contrary, it renders them gloomy and discontented. Even those who in the sober state are sufficiently gay, become occasionally thus altered."† "In the phlegmatic man, the effects of alcohol are less easily and less quickly manifested; he becomes stupid and sleepy." Much, however, as we find the effects of alcohol on the mind modified by coincident circumstances, one thing is certain, that when taken in excess, it excites a state of temporary mental derangement or insanity; "the person talks idly and unreasonably; vociferates loudly; speaks in broken and incoherent language; emits screams, swears alternately, and has no command over his language. In this case there is an evident excitement of the brain, and the symptoms closely resemble those of a paroxysm of phrenitic mania." It is under this temporary insane excitement, produced by abuse of alcoholic liquor, whether purposely or accidentally, that a large proportion of the petty, and many of the most fearful crimes are perpetrated by man. M. Quetelet, in his chapter on the 'Development of the Propensity to Crime,' assigns to the excessive use of intoxicating drinks the increase of crimes against property and person in certain provinces of France. But we need not go out of Britain to find evidence of the effects of the insane excitement of drink in stimulating to

* McNeish, p. 43.

† Ibid., p. 44.

crime; every newspaper, every prison report, tells the same tale; but perhaps the most conclusive evidence on this subject, indeed, we need no other, is the collection of opinions expressed by many of our eminent judges on this head—and generally quoted in works advocating the temperance cause—who have publicly from the bench declared as their deliberate opinion, individually, that drinking alone gave origin to by far the largest proportion of crimes that came before them for trial—crimes from which the perpetrator would have shrunk, but for the short-lived insanity of intoxication.

But the mental health of man cannot be often habitually disturbed, without risking, especially in the predisposed, the permanent overthrow of reason. No fact is more clearly ascertained than the vast amount of insanity caused by drunkenness. "Some men are literally mad when drunk, and it is so uniformly observed in particular individuals, that their neighbours say of one thus influenced, 'He is mad when he is drunk.' Now this state cannot be indulged in with impunity; it may be frequently repeated, but at length the mind permanently gives way; the individual becomes a confirmed lunatic."* On the same point, Dr. Robinson, of Newcastle, in an interesting paper upon the 'Mutual Relations existing between Intemperance and Insanity,'† remarks, "Intemperance and insanity, the two greatest curses of civilization, are in their very nature so intimately connected, that any examination of one would necessarily be incomplete without the other, for both exhibit as their essential phenomena, perversion or disorder of those

* Dr. Joseph Williams, Medical Times, vol. xv, p. 34.

† Journal of Public Health, vol. i, p. 290.

mental powers which impart to man his vast superiority over the rest of the material creation. So close, indeed, is the resemblance between the two states, that whoever has carefully observed the language and conduct of a number of intoxicated persons, must have witnessed most of these varieties of mental disorder, which are unhappily often spontaneous in their origin and of permanent duration. He will have seen, in miniature, the excitement of raving delirium, the maudlin sensibility and groundless apprehensions of the melancholic, the blood-thirstiness of the homicidal, the cunning desperation of the suicidal maniac, the prostration of the moral feelings, the inflation of the mind with delusions as to dignity, wealth, and knowledge; and, finally, in the last stage of intoxication, he will have noticed the gradual disappearance of every manifestation of reason, until the vacant gaze and drivelling smile have for the moment stamped upon the countenance the fearful inanity of idiocy. Since, then, a single dose of an intoxicating substance possesses the power of temporarily disordering the intellect, perverting the moral sentiments, and even wholly suppressing the operations of the mind, it is not wonderful that the continued use of such agents should frequently induce permanent mental derangement. Continuance in that habit may occasion this effect either directly or indirectly. We possess no data by which to estimate its influence in predisposing to insanity; we can, however, readily conceive that it must be very considerable. It is found that the minds of persons who have once laboured under an attack of mania are ever afterwards more liable to excitement, and less capable of preserving their equilibrium whilst exposed to disturbing influences, than those

which have never deviated from a healthy state. We have seen that each fit of intoxication is, in fact, a temporary attack of insanity. We notice in everyday life how frequently the intellects of habitual drunkards become impaired, and, knowing these things, we cannot avoid the conclusion, that an excessive use of intoxicating substances will in time so enfeeble the mind as to render it incapable of bearing ordinary sources of disturbance, and thus act as a powerful predisposing cause of insanity."

Dr. Robinson has drawn up a table, showing the proportion which intemperance bears to other causes of insanity, as exhibited in the returns from ninety-eight asylums in England and Wales. From the table, we find that intemperance constitutes the immediate cause of one seventh of the cases contained in the English asylums. Dr. Robinson, however, considers the proportion estimated much below the real amount, which is marked by various contingent circumstances. Accordingly another table is given, drawn up from the returns of twenty-five asylums. From the second table we learn that one fourth of the cases of insanity admitted are referred to intemperance alone, "and to it, in conjunction with vice and sensuality," nearly one third. It is further remarked that many of those cases entered in the tables as unknown might be added to the list.

Dr. Joseph Williams gives the following Table (p. 88) as the proportion of cases of insanity caused by the "abuse of spirits," admitted into various asylums:*

* Medical Times, vol. xv, p. 107.

	Total Admissions.	Proportion caused by Intemperance.
Charenton . . .	855	134
Bicêtre and Saltpêtrière	2012	414
Bordeaux . . .	156	20
Turin—1830-31 . .	158	17
Turin—1831-36 . .	390	76
Gard	209	4
United States . .	551	146
Palermo . . .	189	9
Caen	60	16
Dundee . . .	14	4
M. Parchappe . .	167	46
M. Bottex . . .	288	54
	5049	940

Were it needful, much additional evidence on this point might be adduced.

There is no doubt when habits of intemperance have reached a certain point, that the unfortunate victim becomes partly insane, at least so much so as to lose all self-control on the one point, and to become affected with the species of monomania to which the term dipsomania has been applied. Sir Alexander Morrison describes it as a "morbid craving for drink which generally occurs at intervals, in which persons are seized with an irresistible propensity to drink to excess, although conscious at the time of their misconduct, but are unable to control themselves. Change of scene, confinement, &c., effect a cure, but relapses are very likely to occur."

In the endeavour, however, to correct either the state of

dipsomania, or to reform a drinker, care must be taken that the brain be not affected, and mania or fatuity produced by too sudden a withdrawal of the accustomed stimulus. Andral relates the case of a man who, being thrown into prison for theft, and of course put upon prison diet, became in the course of a fortnight perfectly delirious, and was only restored to sanity by the physician allowing him a small proportion of brandy daily.* The above might be regarded as a case of delirium tremens; but the boundary line between the latter disease and insanity is so little defined, that it is difficult to say where the one ends, or where the other begins.

* Lancet, 1835-36, vol. i, p. 522.

CHAPTER VIII.

ORDINARY USE OF ALCOHOL UNDER PECULIAR CONDITIONS OR CIRCUMSTANCES?

Recapitulation—Purely Stimulant Action—Chemico-Vital Action—Direct Action—Irritation and Depression—Oxydation in System—The Question, Its consideration—Water-Drinkers — Health — Strength—Endurance—Alcohol in Health, Dr. A. Combe—Ardent Spirits — Fermented Liquors — Ordinary Labour—Severe Labour — Unnecessary Stimulation, Liebig—Alcohol and Muscular Force—Out-door Labour—Indispensable Exertion—Exhaustion, Major Forbes—Anecdote, Mr. Inglis—In-door Labour, Dr. Latham, Dr. Guy, Dr. Robinson—Imperfect Hygiene—Extraordinary Exertion, Dr. Carpenter—Continued Exertion—Deficient Sleep—Remarks—Sudden Efforts—Mental Labour — Natural Stimuli — Alcohol, Dr. Patterson — Hot Climates, Dr. Carpenter, Dr. Copland, Liebig—Remarks—Aromatics—Cold Climates—Fats and Oils, Dr. Richardson—Moist Cold, Mr. Morris—Travelling.

In the preceding chapters, we have seen that the first sensible effect of an alcoholic potation is upon the nervous extremities distributed to the upper portions of the alimentary canal, and to the stomach; that this effect may even be sufficient to cause death in extreme cases—that is, where a poisonous dose of alcohol has been taken. That when the dose is moderate, a sensation of warmth is at once experienced in the stomach, and radiates throughout the nervous connexions of that viscus; that certain stimulant effects are thus communicated to the nervous centres, and thence reflected to the system at large,—this being what we may consider as the purely stimulant action of alcohol upon the nervous system. Further, we have seen, that very rapidly after its introduction into the stomach, alcohol passes into the circulation, and by

so doing, exerts a modifying influence over the chemico-vital processes of the living system, chiefly, by in some way interfering with the arterialization of the blood, by which an increased proportion of carbon is temporarily induced in that fluid. Lastly, it has been shown that alcohol, as alcohol, circulates with the blood, and thus acting directly upon the tissues and organs of the body, influences their molecular transformations; exerting, moreover, a direct stimulant action upon the brain itself, more or less according to the dose, up to a certain point, beyond which if the dose be increased, the system appears to sink collapsed under the action of the spirit, and death to be the probable consequence.

Were these distinctions in the physiological action of alcohol, which have just been reiterated, and their bearing upon its use by man more generally and distinctly recognised, much of the controversy which is at present carried on respecting the uses and abuses of alcoholic fluids might perhaps be obviated.

When a small quantity of moderately strong fermented liquor, such as a naturally fermented wine, or common table beer, is taken, it would seem as if the gentle stimulant effect communicated to the functions generally, the increase of free electricity, the augmentation of nervous power, and the greater rapidity of circulation, were sufficient to resist and dissipate the small amount of spirit, without its appreciably exhibiting the consequences of its chemico-vital reactions: the gentle stimulation is experienced without the oppression; and if the stimulation have been gentle, and the stimulant employed under proper conditions, there is not subsequent depression,—a tonic power has been exerted, and is, as we shall see hereafter, permanent. The above is what might be designated the

best action of fermented liquor upon man. Of course, the action varies both according to constitution and circumstances. As we have already remarked, the stimulant effect is not developed in all; there are some persons in whom the reverse is the case, and bodily and mental depression are apparently induced. This effect is mostly exhibited in individuals of sluggish habits and nervous tendencies, especially when in a state of quiescence: with them one or two glasses of wine will, as it were, irritate the brain, without exciting the nervous system generally; the pulse remains unquickened, the surface cold; and the alcohol absorbed into the blood under these circumstances, exerts its full effect in preventing due arterialization of the fluid, which, thus deteriorated, increases the general state of depression, both mental and corporeal. The flow of ideas is checked, and the spirits depressed. As stated above, however, these peculiar effects of alcohol are generally developed whilst the subjects of them are in a state of quiescence; for in the same individuals, the full excitant effects would be felt and displayed, were the same amount and kind of stimulant to be taken by them during a state of greater activity, either of body or mind.

It is in the sanguine temperament, in the man whose pulse goes bounding along, and whose every function is in a high state of activity, that alcohol produces its most marked stimulant effect, and it is in consequence of any extraneous excitement bringing the sluggish constitution into a state somewhat approaching the sanguine, that it then becomes subject to the excitant effects of alcohol instead of the reverse. Indeed it would seem as if the rapid decomposition of the spirit in the system by the oxygenation of its elements, and the progress of

the excitement, advanced in the same ratio, and it is probable, that for this reason men who have not felt or seemed intoxicated in a warm room, suddenly become so on passing into the air; they have imbibed a quantity of spirit, which, whilst a confined or contaminated atmosphere was only partially purifying the blood, could not be quickly decomposed in, or removed from, the system; it has consequently accumulated, and all at once when pure or cold air is breathed, the decomposition, the burning off of the spirit by the increased supply of oxygen to the blood, goes on with greatly renewed activity, and produces rapid and unexpected intoxication. It may be objected that people in cold climates, or accidentally exposed to cold air, as in ascending mountains, can take a comparatively large quantity of spirit—whisky for instance—without feeling it; in this case, however, the spirit does not accumulate, it is burnt off as it is taken, and the extra heat conducted off as developed; moreover the attendant exercise and sedative effects of cold must also modify circumstances.

With the above premises we proceed to consider the "question" proposed as the subject for the present chapter.

If the question be asked, whether "alcoholic liquors should form part of the ordinary sustenance of man, particularly under circumstances of exposure to severe labour or to extremes of temperature?"

The answer must be—"Of healthy man, generally speaking, decidedly not."

"Both the principles of science" and "the results of practical observation" must bring us to this conclusion. Nay, further, they prove to us, that not only are alcoholic liquors unnecessary as part of the ordinary sustenance of healthy man,

but that their regular, even moderate use, is frequently inimical to the enjoyment of sound health and vigour. We know that many nations, healthy, active, and presenting some of the finest specimens of physical development, rarely if ever taste alcoholic drinks. Such are to be found among the islanders of the South Seas: the boatmen of the Danube are frequently quoted as models of strength and build, and are said to be water-drinkers. Captain Beechey, in his account of the voyage of H.M.S. Blossom, speaking of the inhabitants of Ascension Island, says, that though wine was not refused, water constituted the usual beverage. The muscular activity of these islanders was very great; two of them could each carry the weight of six cwt. without inconvenience.

Among ancient nations, many did not use alcoholic liquors; thus, Cæsar speaking of the Suevi, says that "they were by far the greatest and most powerful in war of all the nations of Germany," and that they did not admit wine to be imported among them, believing that by it "men are enervated, made effeminate and incapable of enduring labour." But, without going out of our own land, we know that now thousands of all classes enjoy health and strength, and, further, declare that they are more capable of enduring hard labour without the use of alcoholic stimuli than with them. The author of 'Anti-Bacchus,' and other advocates of the total abstinence cause, have published documents signed by various individuals, declarative of the greater ease with which they have endured continued hard labour, drinking water only, than when they drank alcoholic liquors. Farther, it is now well known that a very large number, particularly of American vessels, carry no alcoholic fluid on board, and the sailors are said, generally, to do their

work equally well or better than before. Indeed, it is impossible for any one understanding the structure and functions of the living human body, to conceive how the regular use of alcoholic excitants can be requisite for a healthy man surrounded by and constituted with the usual conditions of health, that is, with the blessing of a sound constitution, with sufficient wholesome aliment, fresh air, and exercise, and with a mind tolerably at ease. For such a man no other stimuli are needed than these *natural regular stimuli* just enumerated, and if indulged in, must produce some amount of disorder. The healthy stomach, sufficiently roused to action by the presence of wholesome aliment, if further accustomed to the excitation of alcohol, will resent its withdrawal, or may become weakened by its continued use. We say, may become weakened, for it is impossible to say that it does actually generally become so, seeing how many thousands, in this and other countries, continue the daily use of a moderate quantity of wine or malt liquor, from adult to old age, without suffering one symptom of weakened digestion. It may be said, that in the case of St. Martin already quoted, there was much evident derangement of the stomach unaccompanied by outward symptom. It has already been remarked (and the reader is referred to the arguments then used), that the appearances in, and deductions from, St. Martin's case, are to be taken with some reservation: certainly, such derangements as there described could not go on, or increase, for long, without producing outward symptoms of a grave character. Dr. Combe, however, whose valuable work on digestion has made St. Martin's case so well known, goes on justly to remark, that Dr. Beaumont's observations "cannot be too attentively considered by those who contend that the stimulus of spirits

is not injurious to the stomach or general health, unless where the mischief shows itself by palpable external signs." With respect to the free, or even moderate use of ardent spirits by man in ordinary circumstances, there can be but one opinion: such a practice must be most deleterious, not to the stomach and digestive organs only, but to the nervous and general systems, and, indeed, except as a medicine or extraordinary resource, their employment must be condemned by all. The condition of the stomach described to have been induced in St. Martin's case, "and the consequent failure and vitiation of the gastric secretion, induced by drinking ardent spirits, and by general intemperance, explain at once the miserable digestion and impaired appetite of the habitual drunkard; and it would be well for those who are in danger of becoming the victims of the habit, were they early impressed with some of these striking and important truths."* With respect to the use of less potent beverages, as unadulterated wine or fermented liquors generally, though they are not objectionable in the same degree as ardent spirits, still, we would say with Dr. Combe, "where the general health is perfect without them, they ought not to be taken, because then their only effect is to produce unnatural excitement," and perhaps a morbid condition of the mucous coat of the stomach. That there are states of constitution, nevertheless, not amounting to disease, and yet falling short of the standard of health, which derive benefit from a moderate allowance of wine or malt liquor, there can be little doubt, and in a future chapter we will endeavour to prove this opinion by reference to the highest authorities in medical literature,

* Combe's Physiology of Digestion.

cluding some of the most zealous advocates of the temperance movement.

With respect to the employment of alcoholic stimuli by healthy men, under circumstances of ordinary labour, there can be no doubt whatever, and both science and observation teach us so, that they *are totally unnecessary*. If, however, the question be, whether there do not at times arise circumstances in which extraordinary exertion is called for, and in which stimuli are serviceable, the answer must be—that certainly such circumstances do occur, but not nearly so frequently as is generally imagined; certainly not under what is usually called severe labour, such, for instance, as the harvest-work of the agriculturist, the labour of the handicraftsman, or the mental toil of the professional man. Authorities have been already quoted showing that experience proves the water-drinker to have the advantage in endurance over the drinker of stimulants, and science bears out the conclusion. A man engaged in active bodily exercise of any kind, is undergoing a regular course of stimulation as it is; his will is stimulating the nervous system to rouse his muscles to action, and in this process, both the rouser and the roused are using up their own substance; the acting muscles are sending the blood more quickly through the capillaries and large vessels, and the heart must move more actively to keep pace with them, and transmit the quickly returned blood, loaded with effete matter, to be purified in the lungs; to preserve the balance, the respirations are increased, and the stomach is stimulated to crave for nourishing food which may supply the waste; not for alcoholic stimulant, which can only interfere with this beautiful series of changes and metamorphoses, but for vegetable and animal substance, containing

albuminous and fibrinous principles fitted to keep in repair the ever-wearing structures of man's body, and unstimulating fluid to supply his fluid waste. If the labour be light, the stimulation is light and the waste less, and vice versâ. Surely here is stimulation sufficient, and surely the food which the stomach craves sympathetically with the requirements of the system, must be stimulant enough to ensure its own digestion without the aid of alcohol. All things are already in a state of excitement sufficient for health; to add to this, must be to add what cannot do good, and what must almost inevitably do harm. The nervous system excited by the will, and still further by the rapidly circulating blood, if further excited by alcohol, becomes wild, and therefore unsteady, the stomach pours forth its juice too rapidly, the healthy irritability of the viscus is destroyed, and the natural appetite of health and exercise impaired. The spirit enters the blood, and there its chemical properties come into play, to interfere with and derange the processes of nature's laboratory.

Baron Liebig has done much to give us clear views on this subject, and from him we learn that in the expenditure of muscular force, the substance of the muscles is used, burnt up by the oxygen of the arterial blood, and that this burning up is requisite, that the force may be produced; but alcohol prevents this process; its carbon and hydrogen have so strong a tendency to unite with the circulating oxygen, that they prevent its action upon the integral atoms of the bodily tissues, consequently muscular force is impaired. Thus we see, that those who are frequently in the habit of consuming alcoholic drinks most largely—the out-door labourers in town and country—who imagine they have the most occasion for them, are really

the persons who require them least. It may be, that during active exercise and nervous excitement, the various physiological effects of alcohol in small quantity are not very perceptibly experienced, but if the quantity be increased, the muscular power is lessened, and if it do hold out, when the necessity for exertion is passed, it is followed by a much greater sense of exhaustion.

When alcoholic stimulant is taken for the purpose of enabling an individual, exhausted in body and weary in mind, to continue some indispensable muscular effort, if a small quantity be taken well diluted, it may act most beneficially, but if a large quantity of spirit be taken, especially in a concentrated form, the chances are, that it prostrates what little strength remains. The nervous system either does not respond, or if it does, the response is momentary, and the spirit absorbed rapidly into the blood, puts an end to the requisite change of muscular tissue. Respecting the necessity and advantage of using alcohol sparingly and well diluted in case of exhaustion, a very striking instance is related by Major Forbes, in his 'Eleven Years in Ceylon,' who thus describes the incident, "The great excitement (of a hunt) was now over, and I began to feel the effects of the burning sun to which we had been so long exposed in a bare field: my skin was tight, dry, and burning hot; my face flushed, my head dizzy, and my frame weak. In deference to the opinion of others, and *contrary to my own theory*—that brandy or any other stimulant (even in this climate, and under violent exercise) was unnecessary and hurtful—I was accompanied by a person carrying brandy and water. A tumbler of this restorative I hastily filled and eagerly swallowed. Little did I expect the instantaneous and beneficial change which it produced: the disagreeable

symptoms vanished, and I, who one minute before was weak and helpless, now felt perfectly able for any fatigue. The greatest relief I experienced was the skin again becoming moist, an effect the more readily produced by the water becoming tepid from exposure to the sun."

This incident occurred in a hot climate, and probably Major Forbes did not guide his action by physiological principles, but if he had, he could not have chosen better; the water being doubtless eagerly demanded by the system would be rapidly absorbed, carrying with it the spirit, apparently just sufficient to stimulate the exhausted nervous power to the level of health, without injuriously interfering with the chemico-vital functions. Very different, however, would have been the effect had Major Forbes taken a draught of spirit undiluted; almost to a certainty the effect would have been momentary excitement, followed by irritation, thirst, fever, and prostration of strength greater than before. The very reverse of the above would have happened in a cold climate. Take the traveller sinking down exhausted in a snow-storm, and numbed with cold; then is not the time for diluted spirit; the fluids being comparatively unexhausted, water is not required; spirit, even if strong, might almost appear destitute of strength, as it is said by Sir E. Parry to have done in the case of a party lost from the ships for two or three days, and who were exposed to severe cold. They described a mixture of rum and water they drank in the time as "appearing to them perfectly tasteless and clammy." In cases of exhaustion and torpor from extreme cold, the nervous system must first be powerfully roused by the specific stimulant action of alcohol upon it, and secondly the rapid oxidation of the spirit in the blood, by the

dense air, must give renewed warmth to the sinking frame. Mr. Inglis, in his 'Travels in Norway,' acknowledges owing his life on two occasions to his brandy flask; once, he says, "in a snow-storm when I had sunk, perhaps, never to rise again, a small quantity of brandy sent an instant glow to the extremities, which the moment before had been lifeless, and communicated so sudden and powerful an impetus to the vital powers, that I shall always have reason to bless the providential remedy which saved me."

Contrasting the anecdotes of Major Forbes and Mr. Inglis, we find alcohol acting beneficially in circumstances precisely the opposite of each other. The beneficial action was clear and undeniable; the explanations given by science are equally clear and convincing.

It may, however, be argued, if out-door labourers are better without alcoholic stimuli, there are numbers engaged in exhausting in-door work, alike depressing to mind and body, who require some stimulant, such for instance as factory operatives, tailors in large towns, bakers, &c. It certainly is true that individuals engaged in such occupations have not the advantage of the same natural stimuli as the out-door labourer, and are liable to the depressing effects, more or less, of confined and impure air, deficient exercise, &c., but it is no less true that the effects of these are not to be warded off by the continued use of artificial excitants—nay, rather are to be aggravated. Individuals so situated are for the most part very susceptible of the injurious effects of alcohol. Dr. Latham, as already quoted, says that the excessive use of ardent spirits among the working tailors of the metropolis is a prolific cause of hemorrhage from the stomach and bowels. Alcoholic drinks

taken by in-door workmen are not so quickly burnt off in their hot impure atmosphere as in those employed out of doors; the chemico-vital effects of excess of carbon are developed, and the apparent weariness seems to demand another supply of stimulus to the nerves; the constant repetition soon makes them confirmed drinkers, and disease speedily follows.

In Dr. Guy's evidence, given before the Commissioners for Inquiring into the State of Large Towns,* &c., he says that, by the depressing atmosphere of the places of work, "both the mind and body are injured; the one is in a state to be excited by slight causes, and the other to require, or to seem to require, the aid of intoxicating liquors. Each ministers to the other's weakness, and each reacts upon the other." Dr. Guy says further: "I have made an exact comparison between the classes most exposed to the temptation of drinking, and those who are not more intemperate than the greater part of the labouring class. I have compared, for instance, the drayman with the labourer, the potboy with the footman, and the licensed victualler with other tradesmen; all these comparisons are very unfavorable to the classes most exposed to the temptation of drinking. I find that, before 35 years of age, more than twice as many draymen die as labourers; and that before the same period, the deaths among potboys exceed those of footmen by more than a third." Dr. Robinson, of Newcastle, remarks respecting intemperance: "There are two agencies which operate so extensively and powerfully in vitiating the habits of the poor, that they may be briefly adverted to. They are: 1. The excessive depression of the mental and vital powers, caused partly by the impurity of the air they are com-

* First Report, March 14, 1844.

pelled to breathe, and in part, also, by the discomfort and squalor of their homes. 2. The utter neglect of their moral education, in consequence of which they are left without any check on their passions and desires, though exposed throughout life to more than ordinary temptations."*

With the idea that prevails among so many of the lower orders, that alcoholic liquors really give strength, it is not to be wondered at, if, when suffering depression of mind and body, with work necessary for their subsistence to be performed, they betake themselves to the gin bottle. Much may be done by explaining to them the real nature and action of alcohol upon the human organism, but the cure will never be effected, until, by proper thorough ventilation and sewerage, and properly regulated hours, the workmen are spared the inevitable depressing influences consequent upon the neglect of these first necessities of healthy life. If men, uneducated, or partly educated, have not the natural stimuli of the light and air of heaven, and proper relaxation afforded them,—if they have no mental stimulus presented to them as a change after the physical toils of the day, no object of interest with which to fill the vacuity of the mind, and no attraction save that of a squalid home, most surely will they seek the artificial stimulus of alcohol, and the comfortable fire and comparative cleanliness of the tap-room. But it may be said, the class of cases we have been considering are those of hard, but not of extraordinary or excessive labour. Such a case as we require is given by Dr. Carpenter in his pamphlet on Temperance. It is said "A gentleman who, though moderate in his own habits, was by no means a disciple of the total abstinence system, informed

* Journal of Public Health, p. 292.

us that he had once had the command of a merchant vessel from New South Wales to England, which had sprung so bad a leak soon after passing the Cape of Good Hope, as to require the continued labour, not merely of the crew, but of the officers and passengers to keep her afloat by the use of the pumps during the remainder of her voyage, a period of nearly three months. At first the men were greatly fatigued at the termination of their 'spell' at the pumps, and after drinking their allowance of grog, would 'turn in' without taking a proper supply of nourishment. The consequence was, that their vigour was decidedly diminishing, and their feeling of fatigue of course increasing, as our physiological knowledge would lead us to expect. By our friend's direction, coffee and cocoa were substituted for the grog, a hot mess of these beverages being provided, with the biscuit and meat, at the conclusion of every watch. The consequence was, that the men felt inclined for a good meal off the latter, their vigour returned, their fatigue diminished; and after twelve weeks of incessant and severe labour (with no interval longer than four hours), the ship was brought into port, with all on board of her in as good condition as they had ever been in their lives." The above case is so self-evident, and so entirely in accordance with the principles we have been enforcing, that comment is scarcely requisite.

We have still another class of labourers to consider—those who, from necessity, from the peculiarity of their worldly calling, are obliged to forego at times the proper amount of sleep, and who are called upon for a great amount of continued exertion in a limited time. If any cases require, or derive benefit from a stimulant judiciously administered, it is such as

we have just now adverted to. If rest first, and then nourishment, can be taken, it should by all means be the plan followed. But at times this cannot be done; the nervous system is exhausted from want of repose and overstraining, and yet repose cannot be given it. Such is frequently the case in the medical, and other professions or occupations; a succession of nights of entire or partial loss of rest are endured, and yet the body and mind must both be active for the day's duties. In these cases, no nourishment, no other stimulant is so efficacious in supporting the nervous system, and constitution, as a glass of sound wine or porter. The temporary use of these stimuli under such circumstances does not excite, the vis vitæ is merely raised to its proper level. Without them, nourishment may be taken; but in the absence of rest it will not be duly digested. It may be said, substitute tea and coffee; in such cases, these stimuli are sometimes worse than nothing. If alcohol is to be called a poison under all circumstances, tea and coffee used as nervous excitants are worse poisons still. Granted, they may for a time keep off sleep, but they do so by their peculiar action on the nervous system, which leaves it irritable and disordered to an extent so great, that sleep will not come when the fatigue is over. Under the circumstances we have been considering, a glass of wine, porter, or table beer, will not cause drowsiness or excitement,—that is, if not taken as long as the system holds up by its own natural vis; when, however, it gets below par, if rest cannot be obtained, and exertion is still called for, then a moderate, judiciously chosen alcoholic stimulant, is of much service. So much depends on collateral circumstances and constitution, that it is impossible to lay down any fixed rule in these matters. A

man of strong nervous power will be unaffected by a loss of rest which would totally prostrate another; but even a weak delicate female, may, under circumstances in which the mind is strongly interested, bear up, seemingly without fatigue, under nightly and daily exertion, a tithe of which would at other times have totally knocked her up. Whoever has witnessed a mother watching the bedside of her sick child can well attest this. These, however, are exceptional cases, and do not interfere with the principle, that, under circumstances of occasional long-continued exertion, especially when combined with a diminished amount of sleep, a judicious administration of alcoholic stimulant may not only add to the feeling of comfort, but enable an individual to persevere in and accomplish necessary duties, which otherwise must have been abandoned; and, further, it may, by sustaining the nervous tone, and by enabling a due amount of nourishment to be taken, give the constitution power to resist, or throw off the germs of diseases, especially when of a malarious or infectious character. It has been said, where the exhaustion cannot speedily be remedied by repose, for up to a certain limit, varying of course with the constitution of the individual, the gentle stimulation of a hot fluid, such as coffee, and nourishment, ought to be the means of restoration. In some cases, however, even when exertion ceases, when sleep can be indulged in but will not visit the overwearied frame, and the appetite fails from mere exhaustion, there is nothing will do more to restore both than a moderate dose of wine; and that man's judgment is to be pitied, who would refuse either to himself or to another, thus as it were "ready to perish," the benefit of so valuable a gift to man.

Lastly, cases may occur in which, though undergoing severe

physical labour, the nervous system is unexhausted though fatigued, but some extraordinary effort is required: here the primary stimulant action of a small quantity of alcoholic fluid may be of service. Dr. Joseph Hooker, though condemning strongly the use of stimulants generally, gives us a case just in point; and one quoted by Dr. Carpenter, in answer to the query whether under *any* circumstances the *occasional* use of alcoholic liquors is beneficial. Dr. Hooker * says: "I know of only one occasion on which spirits appeared indispensable, and that was when a little more exertion at the crowning of a mighty and long-continued effort was demanded." The circumstances being described, it is continued: "Towards the end of such a struggle, at the mighty crowning effort, I have seen a little grog work wonders. I could not have drunk hot coffee without stopping to cool; nor if I had do I think it would have supplied the temporary amount of strength which was called for *on the spot*, under circumstances like this. These, however, are extreme cases, which do not affect the sailor in his ordinary condition."

We have yet to consider the mental labourer, the man who lives by the sweat of his brain, who wears out body and mind together. Has he no need of regular alcoholic stimulation? If he be a healthy man, and understand the laws of health, and do not neglect to yield them obedience,—to relax the mind, to relieve the excited brain by exercising the physical powers,—he will not feel to need any regular artificial stimulant; but if he neglect the laws of health, and endeavour to quicken with wine the blood which should be quickened by exercise, then is he on the road to mental obscurity, or to

* Attached to the late Antarctic Expedition.

mental excitement ending in insanity, or to the possession of a sickly body. With due observance of the laws of health, every exercise of the mind is to the intellectual man a pleasurable stimulant, and only ceases to be pleasurable when it becomes an exhausting effort. A minister of the Church of Scotland, in a pleasant little work,* after impressing upon his clerical brethren the necessity of due observance of the laws of health, offers the following judicious remarks: "Languor, debility, and a quick decay of the digestive organs, are inevitably induced by a contrary treatment; and whoever, on the appearance of such symptoms, has recourse to other stimulants than those of air and exercise, in order to help on the flagging powers of vitality, sows that moment the seeds of some mortal disease, under the suffering of which he cannot say that he is guiltless of his own blood."

The use or abuse of alcoholic liquors by man under exposure to extremes of temperature, and the necessity and reasons for their avoidance during the prevalence of hot weather, has already been touched upon in the foregoing pages. A few more remarks may be added to those already made.

The use, regular, or even occasional, of alcoholic fluids in hot climates, except medicinally, or under peculiar circumstances, is condemned by all the best medical authorities on tropical diseases as most injurious, especially to Europeans. Dr. Carpenter says, "All medical men who have practised in India, agree in attributing the large proportion of cases of severe disease, which present themselves amongst Europeans in that country, to the immoderate indulgence in fermented

* The Manse Garden, by the Rev. Nathaniel Patterson.

liquors." Dr. Copland, whose authority is great in these matters, insists strongly on the point. The already quoted tables of mortality among troops in India, and the difference occasioned by a diminution in the amount of spirits consumed, is sufficiently striking.

But if experience bears testimony to the evils resulting from the use or abuse of alcoholic liquors in hot climates, science bears testimony to experience. There can be no doubt that in these climates, the rarefaction of the air, its frequent greater amount of watery vapour, and the consequent diminished supply of oxygen, exert most material influences over the animal functions. Dr. Copland says, "It has been shown by the experiments of Prout, Fyffe, Allen, and Pepys, in an artificially increased temperature, and by those I made in an inter-tropical atmosphere, that heat remarkably diminishes the changes effected by respiration on the blood."* Even in Germany, however, Liebig has calculated that one eighth more oxygen is individually consumed in winter than in summer. Seeing that one great object to be effected by the introduction of oxygen into the system is, whilst producing heat, to carry off the superfluous carbon, it is evident, that in a warm climate where there is not the same call on the heat-producing processes, and where, indeed, it is impossible for the same amount of heat—from chemico-vital action—to be produced as in a cold climate, from failure in the supply of oxygen, a much smaller amount of carbonized ingesta is required. The fact, though frequently pointed out by writers on tropical disease, has more recently and forcibly attracted attention in the lucid explanations of Liebig. Further, Liebig tells us, "the fruits on which the

* Copland's Dictionary, art. Disease.

natives of the South prefer to feed, do not, in the fresh state, contain more than from 12 per cent. of carbon, while the bacon and train-oil used by the inhabitants of the Arctic regions contain from 66 to 80 per cent. of carbon."* Alcohol is so nearly allied to the highly carbonized fats and oils, that independent of its stimulant effect, it is evidently, from its chemical constitution, very ill suited for consumption in hot climates; one of its effects must be, unduly to increase the amount of carbon in the system, and thus to favour the biliary disorders of the tropics. It should be remarked, however, that if we believe we can trace a providential arrangement in the abundant supply of watery fruits and of vegetables granted to the natives of hot climates, we also see a provision against the relaxing influences of heat in the aromatic spices so largely produced in the tropics, which seem to be peculiarly adapted to the wants of the constitution, especially in low marshy situations. The necessity for the use of stimulants of some kind by Orientals, especially in disease, has frequently been pointed out. Dr. Parkes, in his 'Remarks on Dysentery and Hepatitis,' says, "In a Burman, an external sore requires some stimulating dressings; under the water-dressing treatment so useful in Europeans, it would assume a phagedenic and irritable sloughing character." "So also, in dysentery, the astringents and the stimulants which would increase the ulcerations in the large intestines, and the effusion of lymph in Europeans, are the only measures to stop these processes in Burmans."† But the remark might be made, does not the proof that alcoholic fluid is not required for ordinary use, nay, if regu-

* Animal Chemistry.

† Page 130.

larly used is absolutely hurtful in hot climates, favour the idea that from its heat-producing properties it is just what is required in cold regions. It has been already remarked, that in cases of exhaustion under the influence of severe cold, we probably have no remedy so well adapted, in the first place, for rousing the nervous system; and, in the second, for supplying carbon—fuel—for the rapid production of heat; but beyond this, alcohol cannot be considered as a desirable article for ordinary consumption in purely cold climates. In the first place its effect is, as we have seen, much less felt in a cold than in a temperate atmosphere, and this fact may tempt individuals, from not feeling any effect on the system at large, to take it in such quantity as to injure the digestive viscera; and again, its heating effect is very transient, from the rapidity with which it is burnt off in a very cold air; moreover, in the fats and oils, we have highly carbonized substances much better adapted for the maintenance of the animal heat; indeed these substances, from their abundant carbon and hydrogen passing rapidly into combination with the abundantly supplied oxygen in the blood, might almost be regarded as stimulants. Thus, Mr. George Combe* says, "in the arctic regions no farinaceous food ripens; but on putting the question to Dr. Richardson, how he, accustomed to the bread and vegetables of the temperate regions, was able to endure the pure animal diet which formed his only support on his expedition to the shores of the Polar Sea along with Captain Franklin, he replied, that the effect of the extreme *dry* cold to which he and his companions were constantly exposed, living as they did in the open air, was to produce a desire for the most *stimulating*

* Constitution of Man.

food they could obtain; that bread in such a climate was not only not desired, but comparatively impotent as an article of diet; that pure animal food, and the fatter the better, was the only sustenance that maintained the tone of the corporeal system; but that when it was abundant (and the quantity required was much greater than in milder latitudes), a delightful vigour and buoyancy of mind and body were enjoyed."

The peculiarity of climate, which, *per se*, appears more than any other to call for the use of stimulants, especially in individuals of weak nervous power, is that in which marshy and malarious exhalations are apt to exert a depressing effect on the constitution, and thus to favour the attack of disease.

We find that in the tropics, more particularly in moist districts, the aromatic spices are used which *stimulate merely;* in the cold marshy countries, alcoholic fluids which both stimulate and produce heat, are employed. "Mr. Morris, in the 'Prov. Med. and Surg. Journal,' cites cases to confirm his opinion that malaria has a more powerful effect upon persons who abstain totally from stimulants. It has, he says, a very depressing effect upon those who live well, and are of a full habit; it is not to be wondered at, therefore, that it should have a more injurious effect upon those who are essentially the reverse. He has found, from repeated observations, that tee-totallers are more liable to be affected by malaria, and that in them the fever is more apt to become typhus. This, he adds, is not doubted by persons residing in the fenny districts, who are fully acquainted with malaria in all its forms."* The author has recently been informed by a medical man in extensive practice in the West Indies, that tee-totallers if they do

* Medical Times, vol. x, p. 524.

not so soon become affected with the fever of the climate as the intemperate; yet, when they are attacked, sink even more quickly and certainly under it than the latter, and much more quickly than those who use stimuli in due moderation. The above fact has been peculiarly exemplified amid some of the Irish disciples of Father Matthew.

The use of alcoholic stimulants, which many practice during travelling, with the idea of warding off cold, is not generally desirable. Most persons in rapid or long journeys suffer from a feverish state of the system, which is aggravated by stimuli; and, in cold weather, their effect, comfortable at first, is apt to be followed by increased sensitiveness to a low temperature. They are frequently taken more from habit than from any real feeling of want or inclination.

CHAPTER IX.

USE OF ALCOHOL UNDER SPECIAL CONDITIONS OF BODY OR MIND?

Question considered—Ailments — Depression, Causes, Dr. S. Smith—Subject Divided—Constitutional Depression, Description, Cases, Remarks—Super-Secretion, Sexual, Lacteal, Case, Dr. Carpenter, &c.—Depression after Illness, Remarks—Depression from Withdrawal, Remarks—Constitution, Mr. Corfe —Dangers, Cases, Substitutes, Dr. A. Combe—Age, M'Neish — Mental Depression, Remarks—Dyspepsia.

The query with which this chapter is headed may be said to involve the main question as to the utility of, or necessity for, the employment of alcoholic drinks by man, either as articles of daily consumption or of occasional enjoyment. In the foregoing pages it has been more than once pointed out, and enough has been said to prove, that *man in ordinary health, and surrounded with the usual conditions of health, has stimulus enough in the food he eats, in the atmosphere he breathes, in the continually recurring round of duties which engage, or ought to engage, the bodily powers or mental energies, to preserve him in health and strength without the aid of alcohol in any shape.* Again, however, it has been asserted, that even with healthy men there are some special modifications of external worldly relations, in which the judicious administration of stimulant may not only be useful but absolutely necessary; though, at the same time, it is admitted that these occasions are much less frequent than custom and opinion would lead us to believe. It now remains for us to consider, whether "there are any special modifications of man's internal relations, of his bodily

or mental condition, short of actual disease, in which the occasional or habitual use of alcoholic liquors may be necessary or beneficial?"

The answer must be that—there are such special modifications, in which alcoholic stimulant action is both necessary and beneficial. This position is undoubtedly in opposition to the doctrines of the great body of total abstinence advocates, including many of the medical profession, at the same time it is supported by a large proportion of medical men who have given their attention to the subject, and who, however they may condemn the regular use of alcohol, or even its occasional moderate use during health, are agreed, that not only may it be advantageously employed in the treatment of disease properly so called, but even in many minor derangements or modifications of the general health which can scarcely be called disease. This view is supported by Dr. Carpenter, one of the highest authorities in the profession who has stepped forward to advocate the cause of total abstinence. He says, "We cannot conscientiously go the length of denying that under any circumstances, whether of *health or disease*, the administration of alcohol can be justified. We believe that if the whole world could be really temperate in the use of fermented liquors there would be no need of total abstinence societies."

The ailments, or slight derangements of bodily health, to correct which alcoholic liquors are usually resorted to, are those in which there exists some degree of depression, either of the bodily powers generally, or of some function in particular, especially that of digestion. Few individuals, if any, enjoy such a state of redundant health that seasons of depression,

more or less, do not come over them; these states being dependent at times on the various phases of mental and physical influence to which man is ever exposed in his daily life, and which influence we are able to refer to as the evident cause: frequently, however, depression is experienced untraceable to any particular cause to which in the present state of our knowledge we might refer it. We know enough, however, to feel sure that numberless influences, scarcely, if at all "dream't of in our philosophy," are ever acting upon man's mental and physical constitution, and there is reason to believe that many of these changes take place, even in the diurnal revolution of twenty-four hours, and, probably, at more widely separated but regular periods. The absence or presence of light or heat we know exerts powerful depressing or stimulating effects on man and animals, and there is little doubt now that the electric or electro-magnetic influences of our earth and its atmosphere, play, perhaps, a still more important part, either by adding to or diminishing the free electricity of the animal body.* The interesting and novel experiments of Baron Reichenbach have opened up a wide field on this subject. In the experiments of Pfaff and Arhens they found that the quantity of free animal electricity was greater in the evening than at other periods of the day.† Now, considering how many causes, both known and unknown there are which may depress man's vis vitæ, it can scarce be matter of surprise, if, ignorantly and foolishly, he has, careless of future consequences, seized the readiest way of dispelling the unpleasant sensation, and become a drinker of alcohol. Dr. Southwood Smith says, upon this head,† "The

* Müller's Physiology.

† Commissioners' First Report on the State of Large Towns, &c., p. 73.

poison generated in these neglected districts (of large towns), and to which these poor people are habitually exposed, is a sedative poison, among the most distinctive characters of which are the depressing effects produced by it both on body and mind. This is one of the main causes, not only of the mental apathy of which I have already spoken, but also of that physical listlessness which makes them incapable of any great exertion. I am satisfied that this feeling of depression is one of their chief inducements to the use of stimulants, which the same feeling naturally leads them to take in excess whenever a sufficient quantity can be procured. I quite believe, from what I have observed of them, that the inducement to take the most pernicious amount of stimulants often arises from a sensation of lassitude and languor, the direct result of the debilitating causes that are incessantly acting upon them, and that renders them so incapable of physical and mental exertion."

The heads under which we may, as advantageously as any other, consider the subject matter of the present chapter, are as follows:

The use of alcoholic stimuli

In constitutional depression generally, whether hereditary or acquired.

In depression, arising from excess of natural secretions.

In depression, the consequence of disease, after the removal or disappearance of the disease.

In depression, from withdrawal of accustomed stimulus.

In depression of the function of digestion.

In depression, arising from purely mental causes.

There are a considerable number of individuals who all their life through exhibit a constitutional deficiency of vis vitæ, a

want of nervous power; they have, perhaps, from birth been sickly children, the hands and feet almost always cold, and in winter very liable to chilblains; the capillary circulation generally deficient, the fingers and toes becoming what is usually called dead, after any slight exposure to cold, and the individuals themselves liable to be affected by changes which would leave others scathless. If they escape the dangers of childhood, they still carry along with them to adult age this deficiency of constitution; they are always, as it were, below par. The cause of this peculiar weakness of constitution it is not necessary for us here to inquire into; it is not uncommon in the children of aged parents, or it is not traceable to any particular cause; one child in a family is often so affected, the rest being perfectly healthy. The constitution is not one likely to be met with amongst barbarous or semicivilized nations, for two reasons; the first, that their mode of life is not so likely to engender it as the artificial and frequently debilitating customs of civilized life; and the second, that amid a barbarous people, it is only robust children that grow up, the weakly being either destroyed by the parents or by the hardships to which they are exposed. However, arise from what cause it may, the constitution is one which almost invariably derives benefit from alcoholic stimulus, and even at a very early age. Nothing is more senseless, more pernicious, more devoid of all reasonable excuse, than even the occasional administration of stimulants to children generally; but when this state of constitution exists, the benefit derived from their judicious use is striking, even in infancy. In a recent number of the 'Medical Times,' a case is related in which the life of a premature infant was undoubtedly preserved for some time

by small doses of wine properly administered, and the writer has himself prescribed, with the greatest possible benefit, a teaspoonful of sweetened ale, to be given daily for weeks together, to a young infant of six weeks old.

As children of this constitution grow up, in addition to other tonic means, they are certainly benefited by a small quantity of wine, especially in the familiar form of port wine, in which cinchona bark has been steeped; in them, if duly proportioned, it does not produce the flush and quickened pulse it does in a healthy child, it seems merely to bring up to the proper level the indolent powers of the constitution, which certainly appear to gain permanent strength under the treatment, probably from the gentle stimulation regularly communicated to the various functions, which would, and really do, individually and collectively, become disordered from want of action. It is not often that this diathesis is wholly lost as life advances; the subjects of it, even in favorable circumstances, are liable to be depressed by slight causes. If men, slight excesses in early life, which leave their companions unharmed, will prostrate them; the loss of a night's rest completely knocks them up, and their power of resisting cold is extremely small. For soldiers, sailors, travellers, especially in northern latitudes, they are quite unfitted. Being alive to this fact, Captain Sir John Ross recommended that men only should be chosen for arctic expeditions who possessed considerable power of resisting cold. If women, the constitution is particularly evidenced by their inability either to nurse their children well, or for any length of time; neither the nervous nor digestive systems can withstand the lacteal drain, though, at times, as will be seen in a case to be hereafter mentioned, a stimulant, timeously and

properly administered, will do much to support them under it. Individuals of the constitution we are now considering, require a regular full amount of sleep, and are unable to make much exertion early in the morning, or at least till food has been taken. Now, to deprive such as are thus constituted, of all stimulant, is to unfit them entirely, or nearly so, for the business and cares of life; without it, the nervous power flags, the digestion is imperfect, the liver and bowels torpid, and, indeed, the whole of the corporeal functions go on slowly and imperfectly; they may try the total abstinence system, but it will not be successfully, the health will give way, and will be restored only by the regular use of wine or malt liquor. Let it be remembered, however, that these are only exceptional cases, and hold out no sanction to the healthy man for the regular use of a stimulant of which he stands in no need. These deficient, atonic constitutions, are almost always congenital, but may be in some measure acquired, if the system has been weakened in early life by too great a call upon its powers, particularly by premature and excessive abuse of the sexual functions. This bring us to the second head of our subject:—Depression from over-drain upon natural secretions. With regard to sexual excesses, nothing can be more pernicious to the constitution than the effort to support the indulgence by means of stimulants; it may seem to succeed for a time, but cannot for long; the system soon breaks down under the double excitement, and may sink into a state of depression from which it is extremely difficult to rally it. The lacteal secretion, certainly at times, tries the constitution of the female to its fullest extent, and stimulants are popularly thought, and frequently, too frequently, professionally prescribed, as the great promoters

of nursing power, and antidotes to its weakness. There is no doubt, where a female is of good constitution, and able to consume and digest abundant nourishment, she will nurse her child better without stimulants than with; but many cases do occur, in which the judicious use of wine or malt liquor is most beneficial, not only by rousing the functions generally, but, when taken with meals, by increasing the nervous power of the stomach, and enabling it to digest and throw into the system a larger proportion of well-elaborated aliment than it otherwise could. A case exactly in point is given by Dr. Carpenter,* who says: "there are cases—very few, however, in comparison with the whole—in which the conditions of pregnancy and lactation produce an irritable state of the stomach, that prevents it from digesting, or even receiving that food which the system really demands; and in some of these we have known the regular administration of a small quantity of alcoholic liquors more efficacious than any other remedy. In one instance of this kind that fell particularly under our notice, in which the mother was most anxious to avoid the assistance of fermented liquors, the lactation must have been early stopped, on account of the want of functional power in the stomach, and the very poor quality of the milk, had it not been that the administration of a single glass of wine or tumbler of porter, per day, was found to promote the digestive power to the requisite degree, and thus to produce a general invigoration of the system, which was speedily manifested in the improved condition of the child as well as of the mother. The small allowance we have mentioned never required an increase, and

* Pamphlet on Temperance, p. 31.

was relinquished without difficulty, soon after the weaning of the infant."

In pregnancy, indications similar to those noticed in the above case may render stimulants desirable, at the same time the phlogistic tendency which exists in the system during gestation, is a contra-indication which does not occur during lactation.

We frequently find individuals suffering from depressed energy, consequent upon acute attacks of illness—all trace of disease may have disappeared, but the powers of life are lowered. In some constitutions, as soon as the weight of real disease is removed, there is often sufficient elasticity inherent in the frame to raise it from its state of weakness, without the aid of stimulants, properly so called; very frequently, however, a tardy convalescence is assisted and accelerated by their use, even in the soundest constitutions; and in those which are naturally weak, if not absolutely necessary for ultimate recovery, they are yet eminently serviceable in hastening it, and add much to the comfort of a patient. In these cases, a glass of sound wine, or of good porter, seems to give new life; it does not stimulate, as the word is generally understood, the nervous system is below par, and the development of its powers weak, the respiratory material of the body has been, perhaps, nearly used up during a long interval of illness, in which no food has been taken; wine, or malt liquors, are eminently fitted to supply these deficiencies; the peculiar action of the spirit upon the nervous system, so often alluded to, certainly increases its power, and, through it, acts beneficially upon the flagging corporeal functions, especially that of digestion. Further, the heat-producing power of the system, frequently so low during

convalescence, is husbanded by the substitution of the carbon and hydrogen of the alcoholic fluids. It is surprising how great an amount of stimulant can be consumed by a convalescing patient in the first stage of return to health, after some diseases, without the least apparent stimulating effect; so much so, as constantly to elicit expressions of surprise from the patient; but it is soon discovered, as the level of ordinary health is approached, that the same allowance cannot be continued with impunity; it must be regularly diminished, and probably wholly abandoned.

It may be said, that recovery to sound health might be effected without the stimulant, by nourishing food, tonics, &c. It may be so; but we may hazard the opinion, that the great majority of medical men will agree, that the comfort of a convalescing patient, and the rapidity of his recovery, are often materially promoted by the judicious administration of alcoholic stimulant; and, if so, possessing such a means of good, it seems both folly and ingratitude to neglect its employment. In these cases, no subsequent depression follows the use of the stimulant, it seems to enable the functions, individually and collectively, to gain a step towards the level of health, which they do not again lose.

The depression caused in individuals by the withdrawal of the accustomed stimulus of alcoholic liquor, is of such frequent occurrence, and sometimes goes to so great an extent, that it comes to be a source of serious consideration, both in the treatment of disease, and in advising the total abandonment of these liquors, whether for medical or for moral reasons. Much depends upon constitution, and much upon the extent and previous continuance of the habit. The opinion has been already

expressed, that among the civilized (and semi-civilized) inhabitants of large towns, there often exists a certain below-par state of constitution, in which the regular moderate use of stimuli is beneficial; it is scarcely necessary to repeat, that the abandonment of these moderate stimuli is certain, in persons of the above constitution, to be followed by a permanent degree of depression, lasting as long as the abstinence continues, either forcing the resumption of the habit, or inducing a permanent low state of health, with half enjoyment of life, and half performance of its duties. Such persons, however, if they give themselves up to intemperance, suffer more than others, and if they drink so as to cause excitement, the after-depression is extremely great; they have, moreover, great difficulty in abandoning the evil habit, certainly much more—religious, moral, and mental influence being equal—than the confirmed drunkard of originally sound constitution, who has not thoroughly prostrated it by a long-continued course of drinking. Men of naturally good, or even of average nervous power, suffer comparatively little on first giving up even the immoderate use of alcoholic stimulants, certainly not at all from abandoning their moderate use, and are not so liable as others to affections of the nervous system. This is probably partly due to their power of consuming and digesting a larger proportion of food than the man of small nervous force. Of such men, Mr. Corfe, in his interesting lectures upon the 'Physiognomy of Diseases,'* says, "I have repeatedly noticed that men who are in the habit of drinking freely, and who at the same time eat freely of animal food, twice or even three times a day, rarely become the subjects of this disease (delirium tremens);

* Medical Times, 1848.

but if they fall off in their appetite for this kind of food, and still continue to take their usual quantity of beverage, bilious diarrhœa, perhaps, supervenes; they become disordered, dose themselves with salts, &c. and perhaps get bled, and the disease soon sets in..... Such is the fact, at least, with the idiopathic form of this disease." With respect to the traumatic form, "it may be observed, that if a drayman is brought in with a fractured thigh, and is able to continue to eat his accustomed quantity of animal food, with a fair allowance of porter, he is most likely to escape the disease altogether." The same power of constitution will enable such men, viz. those of good nervous and digestive operation, easily to give up entirely the use of stimuli; indeed, after they do so, their general health often undergoes a great and striking improvement. Such men, especially if possessed of strong prejudices, narrow minds, and if of deficient education, are apt to become uncompromising and bigoted advocates of the total-abstinence doctrines, and naturally judge all others by their own experience, forgetful or ignorant of the varied requirements of various constitutions. Even persons of weak nervous power, who habitually use a moderate proportion of stimulant, may derive benefit from its occasional intermission; but if this is continued too long, depression supervenes. The above considerations demonstrate the necessity for paying due attention to constitution, as well as to habit, in counselling the disuse of alcoholic fluids.

To reclaim a drunkard, or to stop an erring mortal on the road to the ruinous vice, scarcely any sacrifice can be too great; if possible, by such an one, let total abandonment be the rule, for like Dr. Johnson, many—most, feel it much easier to abstain altogether, than to be abstemious; in naturally weak

constitutions, however, it becomes a matter of necessity and importance to watch the effects of the measure, and in some way to guard the nervous system from injury by timely interference. It is said that many, accustomed to the use and abuse of alcohol in various forms, have, when on prison diet, enjoyed much better health than at another time; this is doubtless correct, particularly as regards the constitutions already adverted to as bearing the sudden change with least inconvenience, but it is not always so; thus we have the case related by Andral, of a drunkard, who being cast into prison, and put on prison diet, became affected with delirium, but who recovered on being allowed a certain daily portion of spirit. The principle, moreover, is commonly recognized and acted upon in our public hospitals, with regard to patients who have been accustomed to the free use of alcoholic drinks; indeed, it is well known, that not only does their withdrawal endanger the functional integrity of the nervous system, but that in cases of accident, even the reparative processes will not advance under the consequent depression. In one of the public medical journals a case is related of a fracture, which being found to be ununited at the proper regular period, the patient was ordered a moderate allowance of whiskey, in conformity with his previous habits; this had the desired effect of rousing the reparative functions, and causing speedy union. Sir Benjamin Brodie's opinion and practice is, that great gin-drinkers do better under accidents, if a certain allowance is continued to them.* Mr. Tyrrel mentions a case,† already quoted, of a patient who after being some time in St. Thomas's

* Lancet, 1831-32, vol. ii, p. 166, &c.

† Ibid., 1835-36, vol. i, p. 333.

Hospital, was attacked with delirium and partial paralysis of one side: the symptoms were quickly removed by an allowance of a pint of porter and four ounces of gin, daily. Mr. Corfe, in his late lectures, alludes to a case then in hospital, under the care of Mr. Arnott; the patient, a brewery man, suffering from a severe laceration, and doing well, with five pints of the best porter daily, full meat, and extra bread diet.

It is certainly singular, that the above principle, the necessity and importance of which is practically recognised by many of our first medical authorities, should be so much at variance with the statements of some of the most zealous advocates of total abstinence, who declare that bad effects *never* follow the sudden abandonment of the use of alcohol in any form. Were it said that very many, most, perhaps, might abandon their regular use, not only without injury but with positive benefit, the opinions expressed in this treatise, and theirs, would not be opposed; but that all have the power of immediate or even gradual disuse of stimuli cannot be conceded.

It may, however, be remarked, that men suffering under the depressing effects of accident or disease, confined to an hospital, and deprived of their usual natural stimuli of air, exercise, and occupation, have much greater need of their usual artificial excitant, than those who are not so situated; it may be so, but the fact is not sufficient to reconcile the discrepancy.

Under whatever circumstances it may be thought well, either partially or totally, to abandon the use of alcoholic liquors, let the constitution be what it may, it is most desirable to substitute some other stimuli, physical, mental, or both. Dr. Andrew Combe,* after commenting upon the great good

* Physiology of Digestion, p. 144.

which has attended the temperance movement, remarks: "It is probable, however, that the good thus achieved would be still further increased, and rendered more permanent, if mere abstinence from intoxicating liquors were not so exclusively inculcated, and the advocates of reform concerned themselves more in improving the general character, as the surest road to reformation, and in providing resources by means of which the reformation, when once effected, may be fully confirmed. The temperance which is produced by elevation of mind, and by an improved state of moral feeling, will be not only much more beneficial in its consequences, but infinitely more proof against temptations, than that which is observed merely in fulfilment of a vow; and unless something be made to come in the place of the enjoyment which is withdrawn, the danger of a relapse will continue to be great. The importance of this principle, is perhaps not sufficiently recognised in the otherwise valuable labours of temperance societies." It is certain, and also in unison with the established laws of our being, that the withdrawal of an accustomed stimulus must be compensated for. Should any person of doubtful constitution wish fairly to try the system of total abstinence, let him choose the time for commencing, during some agreeable journey and its consequent excitements. Unfortunately, however, this is a time, when in less danger of feeling any immediate effects from stimulants, and not under the same necessity for preserving cool judgment as when engaged in business, men are rather apt to give way to indulgence.

As might be expected, age modifies considerably the effects of alcoholic stimulants upon the body, and also the power of their abandonment. Among ancient nations, age and sex had

much influence in regulating their usages. "Plato considered that no person under eighteen should be allowed to taste of wine, and even then but sparingly. After thirty, more discretion might, he thought, be granted them." It would be well were these rules more attended to in modern times. "In old age, wine is often useful to sustain the system, more especially when sinking by the process of natural decay. The older a person is, the greater the inconvenience of abstaining all at once from liquors, and the more slowly ought they to be taken away."* Our author says, "I cannot bring myself to believe that a man who, for half a century, has drunk freely, can suddenly discontinue this ancient habit without a certain degree of risk: the idea is opposed to all that we know of the bodily and mental functions."†

Of all depressions, mental depression is the one least likely to be alleviated, permanently at least, by alcoholic liquors: it is the condition above all others in which their continual use is most likely to lead to excess—to drunkenness. By mental depression is not meant the passing fit of low spirits caused by some trifle allowed undue weight, or by some fancied evil, neither the transient depressions arising from the varied phases of every man's daily life, but the abiding mental gloom of some deep-seated grief or care: he who drinks to banish this, must drink deep, and drinking deep, is apt to drink deeper still—to become a drunkard. There is but One from whom we must seek consolation in all our griefs and cares, He who has bid the weary and afflicted cast their burdens upon Him; and the man who in deep woe neglects the gracious invitation, the

* M'Neish, p. 164.

† Ibid.

only real source of comfort, and goes to seek consolation in the bottle, exhibits a weakness of mind, and of moral and religious feeling, which is too likely to render him an easy victim to the fascinations of alcohol. Most strongly, most decidedly, must such a course be condemned; the stimulant can neither reach nor remove the cause of his misery, and can only act when, in excess, it drowns recollection and confuses thought. There are, however, minor passing depressions, to which every man is subject at times, which may with some be successfully treated by the occasional moderate use of a stimulant, especially in agreeable society. On this head, the good Bishop Heber remarks, "Suffering under depression of mind, and meeting accidentally with agreeable company, there are few medical applications which would have done me so much good as a motive for an extra glass of wine, and the lively conversation of two young men, for one of whom I had a sincere regard."*

The last depression of bodily function which remains for us to notice, is the one for which, perhaps, more than all others, alcoholic stimulants have been used and abused—depression of the function of digestion. This modification of bodily health, from which so many in the present day suffer, can scarce be said to amount to disease; its consideration, nevertheless, will be more fitly entered upon in one of the sections of the next chapter.

* Journal of Bishop Heber, p. 213.

CHAPTER X.

ALCOHOLIC LIQUORS, THEIR EMPLOYMENT IN MEDICAL PRACTICE?

Question considered—Subject Divided—Acute Disease—Fever, Dr. S. Smith, Dr. Tweedie, Dr. G. Gregory—Softened Heart, Dr. C. J. B. Williams, Dr. Corrigan, Dr. Latham — Chemico-Vital Effects, Dr. Carpenter — Exanthemata — Erysipelas, Dr. Pearson, Dr. R. Williams, Abernethy—Delirium Tremens—Nervous Shock, Mr. Hennen—Hemorrhage, Uterine, &c.—Cholera, Asiatic, British—Thoracic Affection—Abdominal — Chronic Disease—Nervous—Spasm—Chorea, &c.—Thoracic—Phthisis, Sir J. Clark—Heart—Abdominal, Stomach, Dr. A. Combe, Dr. Prout, Dr. Paris—Atonic Dyspepsia, Dr. Gregory—Nervous Influence, Dr. Roget—Remarks—Natural Stimuli—Liver, Dr. Budd—Kidney, Dr. Prout, Dr. G. Bird—Diabetes, Dr. Prout, M. Bouchardat—Bright's Disease—Scrofula—Dropsy, Dr. Gregory—Scurvy, Dr. Christison, Dr. Lonsdale—Skin Disease—Recapitulation.

If dependence is to be placed upon the written opinions and recorded practice of those whose names have stood highest in the annals of medical science, there can be but one answer to the question respecting the use of alcohol as a medicinal agent, and that answer must be one of affirmation and approval. There can be no doubt, that alcoholic stimuli, used with care and judgment, constitute a most valuable class of medicines; that by their use many a valuable life has been saved; that by their abandonment in the treatment of disease, many an one must be needlessly lost. Probably, there are but few medical men familiar with the bedside of sickness, who will not accord with this opinion, and agree, that notwithstanding what may be said by some well-meaning men, carried away by blind enthusiasm in an otherwise good cause, we have no substitutes

adapted to supply the place of alcoholic stimuli in many peculiar diseased conditions of the human frame. It may be objected, that though formerly alcoholic liquors were prescribed by medical men, it was before the movement against their use had arisen, and that now many have abandoned them as pernicious. Some few may have done so; but even amongst our most modern medical writers—those whose names stand highest at the present hour, and some of them advocates for abstinence from the regular use of alcoholic stimuli in any form—we do not find their disuse in medical practice insisted upon. There can be no doubt, that there has prevailed, and still does prevail, an indiscriminate and somewhat unthinking prescription of alcohol, in some of its forms, by medical men; but this, surely, can be no sufficient reason for any man, familiar with the scientific demonstrations and practical experiences of rational medicine, to give up the use of those agents which have so often stepped in between the sinking patient and the grave.

Dr. Carpenter, who has prominently, but at the same time judiciously advocated the total abstinence movement, says,* that though "there can be no reasonable doubt, that a great deal more wine, &c. is employed as medicine than there can be the least occasion for," he at the same time regards the pledge to refrain from even the medicinal use of alcoholic liquors, "as a most dangerous and unwarrantable proceeding," since there are cases in which no other agents can have the same beneficial effect, and the difference may be one of life and death." "Upon the whole, we may say of wine, as of everything else, it is a medicine or a poison according to the discretion and

* Pamphlet, p. 29.

moderation with which it is used, and the skill and judgment which direct its medicinal employment."*

The use of alcoholic liquors in the practice of medicine, cannot, perhaps, be more conveniently considered than under the general heads of acute and chronic disease. To enter into a discussion respecting the medicinal use of alcohol in each particular disease, for it has been used in almost all, enumerated in the nosology, would swell a short treatise into a large book: it will be necessary, therefore, in some measure to generalize our subjects, and whilst regarding diseases under certain general heads, to touch upon such of their leading symptoms, particularly, as may deserve notice, from the use to be derived, or possible abuse to be avoided, in the employment of alcoholic liquors in their treatment.

If alcoholic stimuli are required, as they very frequently are, in the treatment of febrile disease, properly so called, whether intermittent, continued, or eruptive, it can only be as a general rule towards the latter stages of these diseases, and more particularly when, after the development of typhoid symptoms, general exhaustion and sinking of the powers of life supervene. It is not always, however, that the use of alcoholic stimuli must be confined to the latter stages of these diseases: sometimes very early, almost from the commencement, wine is called for, particularly among the ill-fed poor, exposed to the depressing influences of unwholesome dwellings, more especially if they have been regular drinkers. Dr. Southwood Smith remarks, with respect to fever among the poor in 1843:† "The fact is certain, that at the present time an epidemic is

* Thomson's Mat. Med., p. 214.

† Inquiry into the State of Large Towns, &c.; First Report, p. 76.

prevailing, which lays prostrate the powers of life more rapidly and completely than any other epidemic that has appeared for a long series of years;" and that "the prostration from the first is so urgent, that there is no case which requires any treatment at all, that does not stand in need of stimulants." Similar facts are familiar to all who have to do with the treatment of fever among the poor, especially in large towns. Much depends upon the type of fever prevailing, and to this it is requisite to give due consideration in the treatment. Dr. Tweedie, in remarking on this difference,* says, that since 1829, the use of wine, cordials, &c., has been much more requisite than previously; at the same time the doctor insists on due caution in the use of a remedy which, he says, "is too often administered without due regard to the character of the disease." Dr. Tweedie is, perhaps, one of the most moderate advocates for the use of wine, but is very far from advising its total abandonment. Dr. George Gregory, enumerating certain symptoms of the failure of the powers of life, remarks, "unless stimulants, wine or brandy, are duly supplied in quantities proportioned to the exigencies of the case, the patient rapidly sinks."†

We might thus go over the whole range of medical authorities, without finding one dissentient from the opinion that alcoholic stimuli are absolutely necessary in some peculiar phases of continued fever. It is not so much the fever, the stage of it, the individual, that demand their use, as those symptoms, come on when they may, which indicate failure of the powers of life; the irregular action of the nervous system;

* Cyclopæd. Pract. Medicine.

† Elements of Medicine.

the quick, easily extinguished pulse; the cold sweat; the moist, pale, trembling tongue. By some, these separate symptoms are not so much regarded in the administration of wine, as the one great fact of the failure of the circulation, consequent upon softening of the muscular substance of the heart; in this dangerous and alarming symptom, "the first sound of the heart is short, and perhaps the interval between the first sound and the radial pulse is prolonged, showing the want of tone in the arterial force. Dr. Stokes gives an additional indication, where the second sound is actually wanting. Wine should be frequently given, and a little at a time."*

Dr. Corrigan, on the same subject, says: "Wine is a remedy to which we attach great value in meeting the most important phenomena accompanying our present type of fever. For the support, then, of the cardiac circulation, and the still more important one, that of the capillaries, keeping in view the state of the pulse, we give wine."† Dr. Latham, in his admirable "Lectures on Diseases of the Heart," remarks, that the detection of the auscultatory signs of softening of the heart in fever, affords us a guide in one of the most difficult points in its treatment, the administration of stimulants. There is, however, another important office, beyond its stimulant effect, to be fulfilled by wine in the latter stages of long-continued febrile disease, which is, its action in supplying materials for some of the chemico-vital processes of the system, especially for sustaining animal temperature. "There can be no doubt, that, in many diseases of exhaustion, the want of power to sustain the requisite temperature is the *immediate* cause of

* Dr. C. J. B. Williams, Medical Times, vol. xii, p. 323.

† Medical Times, vol. xiv, p. 15.

death; the whole combustible material of the body having been exhausted, and the digestive apparatus not being able to supply what is required. Now, where this is the case, there is no doubt that life may be prolonged, and that recovery may be favoured by the judicious sustentation of the temperature of the body. This may be effected either by internal or by external means. Of the internal, the most efficient is undoubtedly the administration of alcoholic fluids, which will be absorbed into the circulating system, when no other alimentary substance can be taken in; and which, moreover, exert a favorable influence by their specific stimulating effect upon the nervous system. It is a matter of familiar experience, that in such conditions of the body, the quantity of alcohol which may be administered with positive and evident benefit, is such, as would, in ordinary circumstances, be productive of the most injurious results; and this is fully accounted for by the reflection, that it is burnt off as fast as taken in."*

Some further remarks of Dr. Carpenter on this subject are so apposite, that we offer no apology for copying them at length. He says:† "There is another class of cases in which it appears to us that alcohol may serve a most important purpose that no other substance can answer. We refer to those in which there is a positive deficiency of heat-producing materials in the system, and in which the digestive apparatus is, for the time, incapable of introducing such as are ordinarily most serviceable for this purpose. Such a condition is the result of many exhausting diseases, and more particularly of certain forms of fever, in which, without any particular local affection, the powers of the

* Carpenter's Manual of Physiology, p. 68.

† Pamphlet, p, 32.

whole system are prostrated by the action of a poison introduced into the blood. Day after day the fatty matter of the body is used up in the respiratory process, and no food is taken in to replace it; and thus, as in cases of simple starvation, the patients die of *cold,* unless some means be taken to sustain their heat. Now, there is reason to believe, that when alcoholic liquors are received into the stomach, they are taken into the circulation, not by the lacteals, but by the more direct channel afforded by the permeable walls of the capillaries of the mucous membrane. Theory would teach us, that through such a thin septum, the alcoholic fluid, being thinner than the blood, would pass towards the latter by endosmose; and experiment fully confirms this view, since it was found by Sir B. Brodie, that alcohol in strong doses exerts its usual effects upon the system, even though the thoracic duct be tied; and MM. Bouchardat and Sandras have obtained evidence of its presence in the blood of the gastric veins. Thus, then, alcoholic fluids introduced into the stomach can be directly absorbed, without any of that preparation which the oleaginous or farinaceous materials of combustion require; and we can well understand, therefore, how, in the advanced stages of fever, when everything depends upon the power of sustaining life until the poison has been expelled from the system, alcohol should be a more powerful therapeutic agent than any other.

A severe epidemic of the kind we allude to (the synochus of Cullen), which we witnessed some years ago, afforded us the opportunity of seeing the results of opposite modes of treatment in two sets of cases as nearly similar as might be: in neither were any very decided measures adopted during the early stages of the fever, for none seemed called for; but in

one set the same expectant practice was continued to the end, whilst in the other the administration of wine and spirit was commenced as soon as the weakness of the pulse and the coldness of the extremities indicated the incipient failure of the circulating and calorifying powers. The quantity was increased as the necessities of the patient seemed to require; and we remember one case, in which a bottle of sherry, and twelve ounces of whiskey every twenty-four hours, was the allowance for some days. The result was, that the mortality on the former system was at least three times as great as on the latter; the patients dying from simple exhaustion and cold, and no local lesion being detectible on post-mortem examination. Now, in cases where alcohol is thus beneficial, there is an absence of anything like stimulating effects. The pulse is usually *lowered* in frequency, instead of being accelerated; and the brain is brought back to more regular action, instead of being disturbed. That a very large quantity of alcohol can be thus given without producing a stimulant effect (and the same is probably true of alcohol taken during exposure to very severe cold) is probably due to the fact of its being burnt off almost as fast as it is taken into the circulating system, so that it never accumulates to such an extent as to act injuriously on the brain. We are acquainted with no case in which the beneficial influence of a particular remedy, when administered with caution and discrimination, is more obvious; and we would strongly urge upon those who *intemperately* (as we think) advocate the total-abstinence cause, and who deny that alcohol *can ever* exert any beneficial influence on the human body, to consider whether so clear a case is not here made out, as to show that one exception, at any rate, must be made to

their assertions." Further comment on this head would be superfluous.

In the exhaustion of the latter stages of febrile diseases generally, wine is used pretty much upon the same principles; in the exanthemata, however, we find its use called for, and generally sanctioned, in those earlier stages of the disease, in which failure of the eruption, with sinking of the powers of life, often threaten the existence of the patient: such is the case in measles, smallpox, scarlet fever;* wine and other stimuli hold out almost the only chance for life. Of course in the latter stages of the exanthemata, the same indications may call for the use of wine as in fever generally. Towards the close of the eruption of smallpox, wine is very frequently necessary.

There is probably no disease which has undergone, and has required more variety in its treatment as regards stimulants, than erysipelas. This disease, which in the strong florid countryman calls for active depletion in various ways, when it occurs in the person of one of the debilitated inhabitants of one of our large towns, may require the early use of wine in order to conduct matters to a successful issue. Dr. Sigmond has remarked,† "My valued preceptor, the late Dr. George Pearson, often mentioned in his lectures the surprise he felt, on his first settling in London, to find that erysipelas was cured by bark and wine here, whilst he had been in the habit of seeing the most practical men in Edinburgh, successfully

* This sinking in scarlet fever is at times so sudden, so unexpected, that patients will sometimes sink and die in a couple of hours from being in a most favorable condition; and no appreciable lesion be discoverable after death.

† Lancet, 1837-38, vol. ii, p. 141.

treat it by venesection." Dr. Marcet, physician to Guy's Hospital, determined to try which plan of treatment of erysipelas would be most successful, the antiphlogistic or the cordial system. He placed two individuals labouring under a disease, which bore very similar characters, close to each other; to the one he gave tonics, generous diet, wine, and the stimulating medicines; to the other, salines and low diet, and blood was also abstracted from the arm; both the persons recovered; but the one who had been treated with the wine and the tonics recovered very rapidly, whilst the other lingered for a very considerable length of time in a very debilitated state. Dr. Robert Williams, who also advocates the use of wine in erysipelas, cites cases illustrative of its beneficial effect; and Abernethy, in his lectures, used to speak favourably of the use of stimulants in that disease, especially among the lower orders who had been accustomed to drink gin.

In the treatment of acute inflammatory affections of the nervous system, any form of alcoholic stimulant is of course contra-indicated. We find, however, its use, and its liberal use, at times called for, in that singular and obscure affection of the brain and nerves, delirium tremens. This disease, arising in the first instance from the continued abuse of alcohol, or from the sudden disuse of the excitant, frequently requires its modified continuation or renewal. Whatever may be the real pathology of this disease, it is apparently connected with an exhausted condition of the nervous apparatus, which is increased or produced by the discontinuance of the exciting cause. In spurious hydrocephalus (the hydrocephaloid disease of Dr. Marshall Hall), active stimulation is requisite: Dr. Watson recommends either sal volatile or eight

or ten drops of brandy to be given to the child during the continuance of the more prominent symptoms.* For sustaining the nervous system under the shock of severe accident, the timely regulated use of stimulant is of much importance, even in concussion of the brain itself, the extreme depression requires to be combated either by alcohol or ammonia. In the battle-field, the wine-flask is a necessary not to be dispensed with. On this head, Mr. Hennen, in his "Military Surgery," particularly insists, saying, that many lives might be saved, and the patients placed in a more favorable condition for undergoing primary operations, by the early administration of a small quantity of wine. Although brandy and wine were allowed to the wounded Russian soldiers in Paris in 1814, it is said that their mortality was much less than that of the Prussian, Austrian, &c., kept on low diet

In addition to the shock inflicted upon the nervous system peculiarly, in the case of severe wounds, there is generally to combat the shock, the effect of hemorrhage. Although syncope from this cause is not to be rashly interfered with, still, there is a limit to its permission, when a stimulant becomes absolutely necessary to preserve life, by the exertion of its excitant effect upon the circulatory powers. This point is probably more forcibly illustrated in cases of uterine hemorrhage than in any others; and they at least who have had to deal with those fearful cases, ought to appreciate the boon of the stimulant which seems to bring back life, restores the welcome beat of the imperceptible pulse, the colour to the lips, quiets the distressing restlessness, and allows those necessary measures to be taken, which, but for its valuable aid, must have extin-

* Watson's Lectures, vol. i, p. 449.

guished the flickering spark. It is needless to quote authorities on a subject which none but a blinded enthusiast would controvert.

Many cases occur among children, in which, from neglect or some other cause, the hemorrhage from leech-bites is in danger of producing fatal syncope; and probably it has happened to many, as it has to the writer, to sit for hours by the bedside of a little patient, thus hovering between life and death, sustaining with wine and water the powers which threatened to sink if the interval between the often-repeated spoonfuls was more than usually prolonged—surprised at the same time at the quantity taken by a mere infant without stimulation being manifested, until the *vis vitæ* had acquired strength to stand alone.

Nearly allied to hemorrhage in some of its effects is Asiatic cholera. Here, from whatever cause resulting, we have a prostrated nervous system, and the vessels drained by what may be called a serous hemorrhage; in short a state of collapse and depression of the whole system, which naturally suggests to the mind the use of stimulants for its removal; and, accordingly, they have been largely employed, and are more or less recommended by writers on the subject. One of the latest, Mr. Thom, in his 'Report on the Kurrachee Epidemic,' has strongly advocated their use "per ano." In British cholera, in its more severe form simulating the Asiatic disease, with general collapse, much benefit certainly accrues to the patient from small quantities of hot stimulant frequently administered. In the state of depression, which, especially in children, follows severe burns or scalds, stimulants are for a time almost solely to be depended on for the preservation of

life; ammonia certainly may be given, but a child will much more readily take a little sweetened wine, or spirit and water, and for this reason these ought to be preferred.

In the treatment of acute affections of the viscera of the chest, alcoholic stimuli can rarely be required; if ever they are called for, it must be as a last resource in cases of extreme depression of the powers of life, and then in small doses, only sufficient to rouse the nervous system, In most cases of this kind, however, ammonia is most suitable; for not only does it stimulate generally, but it undoubtedly exerts some specific effect upon the bronchial membrane. Further, in such cases, when the oxygenation of the blood is more or less impeded, there is not the risk to be dreaded, as in the administration of alcohol, of still further interfering with that process. In chest, as in other affections, there sometimes occurs what may be called an *accident of disease*, which imperatively requires active stimulant treatment; of this the following is an apt illustration. In a case of empyema, by some means, suddenly, a communication was opened between the bronchi and the effusion, and very fetid matter expectorated with incessant cough; at the same time, sudden alarming sinking of the vital powers supervened, the pulse became imperceptible, the cold sweat of death broke out over the body, the face was hippocratic, dissolution appeared momentarily inevitable, and was only arrested by the use of strong stimuli. For six hours this condition continued; but at the end of that time, after close watching, and the unceasing administrations of brandy and ammonia, the constitution began to rally—it had been, as it were, floated over the danger. The patient recovered. In this case it is impossible to say that ammonia alone *might* not

have saved life; but at the same time it might, if given alone in large quantity, have occasioned sickness and vomiting, and if it had, the feeble spark of life must inevitably have been extinguished,

In acute affections of the abdominal organs, alcohol can only be admissible in some of those states of collapse which have already been alluded to: too often the spirit has been the cause of the disease, especially in warm climates.

The question of the administration of alcoholic stimuli in acute disease, whether of a general or local nature, is comparatively circumscribed, and affords comparatively little room for diversity of opinion; indeed, whatever be the disease, if failure of the powers of life, characterized by nervous depression and sinking of the circulation supervene, stimuli are rarely out of place. In chronic disease, the field of disputation and doubt is much wider, the striking indications for the use of excitants which the latter stages of acute affections afford us, are here wanting; and in the slow, often obscure processes of organic change or functional disorder, we are much more liable to perplexity and error; we find at times the highest authorities opposed to each other on the subject, and even in practice, that the stimulant which has suited one case well, must be dispensed with in another, apparently in every respect similar.

There can be no doubt that, in the treatment of chronic disease, immense injury has resulted from the indiscriminate prescription or permission of the moderate use of alcoholic drinks; and medical men are becoming every day more alive to the fact. The employment of these stimuli in the treatment of chronic disease, naturally resolves itself into their

regular use as an article of medical regimen, and into their occasional use in those sudden changes and accidents to which the subjects of chronic affections are continually liable.

In prescribing or permitting the use of alcoholic stimuli in diseases of the nervous system, the constitution and previous habits of the individual of course require especial consideration; in such cases, where they have not been habitually used, tonics, medical, general, or both, will probably bring up the vis vitæ to the proper level; in some cases, however, such as chorea, when the result of pure nervous debility, the judicious employment of wine or malt liquor is serviceable. In this disease, as in irregular actions of the nervous system generally, it is difficult to explain the *modus operandi* of alcoholic or other excitants. That the spirit is beneficial in such conditions there can be no question, whether acting by direct application to the stomach in affections of the viscus itself, or whether by stimulating the nervous system at large, it relieves general irregular action, as indicated by the subsultus of typhus, or dispels local spasm, in angina pectoris or hiccough. The same power, moreover, is exemplified when the intemperate man—in the state of collapse—seeks the stimulation of alcohol to steady the trembling hand, the effect of a nervous system weakened by excess; or in the effect which alcohol or other excitant exerts in restoring temporary regularity to the intermittent pulse of disease. Where a patient, suffering from chronic disease of the nervous organism, has been accustomed to the regular use of alcohol in any form, the very fact of the spirit acting so specially upon the nerves renders the consideration of its use or prohibition doubly necessary. In affections of the great nervous centres, particularly, there can

be no question that, where it can be borne by the patient, the disuse of alcoholic stimulant is the safest course, let his previous habits have been what they may; at the same time it must be recollected, that the withdrawal of the accustomed stimuli, may not only keep up disease, but induce it, by favouring an anemic condition of the brain, which is no less inimical to health and life than the contrary state. The already quoted cases of Andral, Mr. Tyrrel, &c., may be referred to as sufficient illustrations of our subject; and from them we may learn, that, however great should be the caution exercised in the use of stimuli, equal caution is required to guard us from too great error on the other side, lest we sacrifice the health or life of a patient on the shrine of some favorite theory or doctrine, instead of acting upon that rational consideration of the various collateral influences which modify every case of disease.

In the treatment of chronic disease affecting the thoracic viscera, alcoholic stimuli may be serviceable, either as articles of general use, or as occasional therapeutic agents, to be employed in the treatment of those incidental affections to which persons so situated are liable. As articles of regimen, they are frequently beneficial, and add much to the comfort of sufferers exhausted by phthisis, by the profuse expectoration of chronic bronchitis, and similar depressing diseases of the lungs; at the same time much harm may be done by them in some constitutions and states of disease. "In phthisis, probably, much injury is done by the indiscriminate prescription of wine, and especially malt liquors: regarded as a disease of debility, it is forgot that it is likewise one of irritation and fever. In some cases, doubtless, where the irritation and fever are

trifling, and the digestive functions impaired, a moderate quantity of porter is beneficial; but generally speaking, as we are told by Sir James Clark, 'many more patients are preserved by the early adoption of a milk and vegetable diet, with a residence in the country.'"*

In asthmatic cases, if the habit of taking stimuli has been regular, it may be necessary to continue their modified use, lest the stomach and nervous system, resenting their withdrawal, become disordered, and thus aggravate the sufferings of the patient.

In some affections of the heart, particularly those connected with dilatation, softening or weakness of its muscular structure, the sudden withdrawal, or even the withdrawal at all of an accustomed stimulant, cannot be devoid of serious danger; at the same time, the liability of all thoracic diseases to be aggravated by stimuli, renders their disuse, if possible, always to be desired, and their use to be superseded by natural stimuli and general tonics. Where the cardiac disease is accompanied with extreme general debility, life may be prolonged, and rendered more tolerable by the allowance of some alcoholic drink. In the 'Lancet' a case is recorded in which a patient affected with hypertrophy and granular kidney, consumed a bottle of wine daily, with benefit, for some months previous to death.

In the sudden accidents which frequently occur in connexion with cardiac disease, powerful stimulation is often instantly required; ether or ammonia first, then spirit or wine, whichever is first to be procured. That man must be an enthusiast indeed who would hesitate to grasp the brandy-

* Cyclopæd. Pract. Med., art. Phthisis.

bottle in treating a case of angina pectoris; he must also be prepared to combat the authority of the most valued writers, from Dr. Heberden downwards.

In no class of chronic diseases has the employment of alcoholic liquor been more abused than in those affecting the various organs of the abdomen, more especially the stomach, liver, and kidneys; indeed, from the immoderate use of these stimuli, many of the organic affections of these viscera take their origin. The organs and functions of assimilation are peculiarly under man's own control, and accordingly we find them peculiarly liable to become disordered from his mismanagement, ignorance, or self-indulgence. The stomach, as the first and most directly reachable organ, first suffers; the liver, the mucous lining of the bowels, the kidneys, follow. The many uneasy sensations connected with mal-assimilation, are, frequently, so quickly relieved by a dose of spirit or wine, that we can scarce be surprised at the ready use of a pleasant palliative; and that relief once experienced, the remedy is again resorted to, either in ignorance or defiance of the permanent injury which may be engendered by the practice. "Many persons imagine that spirits taken in moderate quantity cannot be injurious, because they feel no immediate bad effects from their use." "The evil attending their unnecessary use may not be felt at the moment, but nevertheless it is there."* There can be no question that, to a stomach in the healthy exercise of its functions, the natural stimulus of ordinary food and simple drink is sufficient to excite it to normal action; and that in such a case the ordinary use of extraordinary stimuli is, at least, likely to occasion disorder. "If

* Combe's Physiology, p. 144.

all the functions of the system are already vigorously executed without the aid of spirits, their use can be followed by only one effect—morbid excitement."* Evidently, then, those cases of dyspepsia which take their rise in the use or abuse of ardent spirits, or of alcohol in any form, are most likely to be cured by the abstinence system, that is, if the affection has not passed beyond the stage of irritation or subacute inflammation. When the stomach has become case-hardened, as it were, against the action of powerful excitants, and requires something more pungent than ordinary wholesome aliment to spur it on to the exercise of its functions, the withdrawal of the stimuli requires more caution.

The sub-inflammatory, irritable forms of dyspepsia, constitute, however, but one phase of the proteän malady, and are most likely to be induced in persons of naturally strong digestive powers by any continued irritation of the mucous coat of the stomach; this state, as we have above remarked, is apt to pass into one in which the stomach will respond only to the influence of excitants, properly so called; in fact the use of spirit, wine, or malt liquor, becomes indispensable to the digestion of food. "It may, perhaps, be laid down as a rule without exception, that the stomach requiring the aid of stimulating fluids during meals to enable it to do its duty, is in a state of disease; or certainly not in its natural state." † Such a condition is, of course, to be deprecated, and ought by thinking men to be corrected as soon as possible. Some who have drank from habit merely, and in moderation, can at any time abandon the habit without suffering the slightest incon-

* Combe's Physiology, p. 144.

† Prout on Stomach Diseases, p. 8.

venience; others, however, especially if at all dyspeptic, find more difficulty, the stomach flags for want of the excitement, and indigestion ensues. Dr. Paris says, "In cases where the vinous stimulant has been withdrawn, we have generally witnessed an aggravation of the dyspeptic symptoms, accompanied with severe depression of spirits."* When there is a fair stock of constitutional vigour, nevertheless, perseverance, and attention to the principles of health will frequently overcome the difficulty.

It must be remembered that the above remarks apply to those who have either abused alcoholic stimuli, or who having used them only regularly and moderately, have done so without the least necessity. In the purely atonic forms of dyspepsia, whether constitutional or acquired, there can be no question that some stimulant is called for, either temporarily or permanently, and that alcohol in some form is frequently beneficial. Dr. George Gregory well remarks,† that a morbid condition of the nerves is very often the proximate cause of dyspepsia. The disease "is often associated with general torpor, and deficient nervous energy through the system generally." "A variety of facts unquestionably prove that the functions of the stomach are very much influenced by the states of the nervous system. The section of the par vagum, or eighth pair of nerves in the neck of an animal, is followed by the almost total interruption of digestion; whence we may infer that the influence conveyed by these nerves is necessary both for the secretion of the gastric juice, and perhaps also for the muscular actions of the stomach. It is

* Cyclopæd. Pract. Med., vol. i, p. 589.

† Elements of Medicine, art. Dyspepsia.

exceedingly remarkable, however, that where the galvanic influence is sent through the mutilated nerves, by means of a voltaic battery, digestion may be renewed, and goes on for a considerable time; whence it has been inferred by Dr. Wilson Philip, that the nervous power, or the agency which is conveyed through the nerves, and which influences the secretion, is itself identical with the electric or galvanic fluid." * However some, with Müller and others, may dispute the power of electricity in restoring the secretion of the gastric juice, unquestionably its secretion in sufficient quantity, and of healthy quality, is much dependent upon the integrity and activity of nervous power; and whatever influence, whether mental or physical, interferes with the transmission of, or unduly abstracts that power from its direction to the stomach at proper seasons, impairs digestion even in the healthy.

It has been already remarked, that when atony, diminished nervous power of the stomach, exists, stimulation is called for; and, undoubtedly, much real benefit, free from any injurious effect, is derived from the well regulated employment of alcoholic liquor; by its means the stomach is enabled to digest food for the ordinary requirements of life. "The primary effect of all distilled and fermented liquors is to stimulate the nervous system and quicken the circulation; in all conditions, therefore, in which the action of these requires to be supported, they are calculated to be useful." † It is frequently said in the arguments, especially of the non-professional advocates of total abstinence, that alcohol retards instead of quickening digestion; this is contrary to the expressed opinions of

* Roget's Physiology, vol. i, p. 334.

† Combe's Physiology, p. 142.

our best authorities. Even Dr. Carpenter, who condemns the use of alcoholic stimulants in chronic disorder of the digestive organs as "pernicious," admits, that in some cases their "benefit is to be looked for in their stimulating action upon the digestive apparatus, which enables it to prepare and introduce into the system such an amount of nutriment as it would not otherwise be able to assimilate." The origin of the fallacy has probably been owing to inattention to the difference between a healthy and an atonic stomach. Whether that atony be confined to the organ itself, or is sympathetic with physical derangement in some other part of the system, or with mental depression, there is insufficiency of nervous power, and the stimulant action of alcoholic fluid acts beneficially by exciting due action, and if care be taken not to carry the stimulus too far, the amount of excitement communicated to the stomach in a state of atony, will not probably exceed that produced in a healthy organ by ordinary aliment.

Depressing mental emotions, and doubtless other depressing causes, "produce a pale flaccid condition of the mucous membrane"* of the stomach. On this membrane, in such a condition, a stimulant cannot exert the same power as on one in the full vigour of nervous energy and of capillary circulation. A precisely similar state of surface we find on the skin in diseases of depression, and this, every practitioner knows, responds much less easily to the action of vesicants than the opposite condition. Enough has now been said to prove that in considering the use of stimuli, whether alcoholic or otherwise, in dyspeptic affections, due consideration is requisite as

* Carpenter's Manual of Physiology, p. 276.

to the condition being one of excited action or of nervous atony.

Let it not be supposed that it is here meant to advocate either the cure or alleviation of dyspeptic affections of any kind being trusted to alcoholic stimuli when they can be dispensed with, when we can substitute the better natural stimuli, of air, exercise, relaxation, travelling, and such like, neither to suppose neglect of proper medical treatment; but as society is now constituted, many, most men, cannot pick and choose their times and their seasons, they must keep on the battle of life with its depressing anxieties and cares, amid the depressing physical influences of our large towns, from month to month, or from year to year, with little or no relaxation; these are the men who suffer from atonic dyspepsia: by all means, if they can, let them seek health and renewed vigour in the tonic natural stimuli we have just alluded to; but if they cannot, it is folly, and worse than folly, to refuse to the exhausted nervous system, to the pale flaccid stomach, a provision for the exigencies of civilized life, which will do much to improve comfort, to add to the power of mental and physical exertion, and to prevent disease.

Alcohol in any form can scarcely ever be required in the treatment of liver affections; on the contrary, its use is generally to be reprobated as an article of regimen, with, perhaps, the one exception of extreme torpidity, either of the gland alone or of the system generally. In such a case, a moderate proportion of malt liquor will act beneficially by promoting a more abundant secretion and excretion of bile. The probability of its being serviceable in such cases is borne out by some remarks of Dr. Budd, in his valuable work on ‘ Diseases

of the Liver.'* He says, in some cases, when too little bile is secreted, "digestion is performed slowly, and nutrition suffers; the bowels are irregular and generally confined," &c. "Disorder of this kind is sometimes produced by too great abstemiousness, to which weakly and nervous persons are often led by painful digestion;"—"the disorder will not be removed until the patient becomes less abstemious." Although Dr. Budd does not name the use of malt liquors in such cases, there is no article of aliment which is more likely to rectify, or at least to aid in rectifying the deficiency.

In affections of the kidneys, the nature of the alcoholic compound exerts, perhaps, more influence than in most other diseases. Thus, for instance, though gin—which was first known as a diuretic medicine—may occasionally be prescribed with advantage in cases of lithic and oxalic-acid deposit, all descriptions of malt liquor, and most of the acescent wines, especially in the former, must be avoided: here, however, the effect does not depend upon the alcohol, but upon its combinations. Dr. Prout, whilst enjoining abstinence from fermented liquors in the oxalic-acid diathesis, says:† "Sometimes a little good porter agrees well, and may be taken. When porter is deemed objectionable, weak brandy and water is preferable to most wines." Dr. Golding Bird excludes beer and wine, but recommends the use of a small proportion of brandy and water.‡ In diabetes, Dr. Prout says: "With very few exceptions, I have seen more relief from thirst, and more support given by porter, in diabetic cases, than by any

* Page 260.

† Stomach and Renal Diseases, p. 73.

‡ Urinary Deposits, p. 143.

other means whatever."* Dr. Rees considers alcoholic stimuli "necessary to maintain power in the advanced stages"† of the disease. M. Bouchardat lays it down as one of the imperative conditions of the treatment of diabetes, "that a certain quantity of wine, especially claret—which has been found superior to all other wines in France—be allowed," "and that the treatment be assisted by tonics and stimulants;" and by the same authority, "considerable importance is attached to alcoholic stimulants, such as wine, rum, and brandy, taken in moderation."‡

In his observations upon the treatment of serous urine, and of granular degeneration of the kidney, Dr. Prout says of fermented liquors, that though the less taken the better, much must depend on the previous habits of the patient. In the incipient stage of the disease, he allows, if the patient have been accustomed to wine or spirits, a little sound sherry or hock, or a little hollands if preferred; and further remarks, "With respect to drinks, in addition to what we have above stated, we may observe, that though fermented liquors of all sorts had better be shunned, yet cases will occasionally occur in which it will be proper to break through this rule; for as the greater number of individuals affected by the anæmotrophied forms of disease more especially, have brought on, or at least aggravated, their complaints by the excessive use of fermented liquors, it will not be prudent, or perhaps possible, in all instances to abstract fermented liquors entirely and at once; and hence it may be necessary in some instances to continue

* Stomach and Renal Diseases, p. 43.

† Rees on Blood and Urine, p. 180.

‡ Journal of Medical Science, Sept. 1848.

their use for a time, and diminish by degrees the quantity taken. In such cases those fermented liquors which have a tendency to keep up a moderate flow of urine will, in general, be found most useful."*

In scrofulous affections generally, when irritative fever is absent, wine and malt liquors are frequently of much service; they probably act by stimulating the indolent stomach to the more rapid and perfect digestion of the food.

In dropsy, the use of alcoholic stimuli, when admissible, must be regulated by the primary cause of the disease, and the previous habits of the patient. Dropsy is one of the most frequent affections of drinkers, and by the time it shows itself, the powers of the constitution have been greatly undermined. In these cases, to withdraw entirely the use of stimuli, would only be to hasten the fatal issue, and under due regulation they must be continued. Gin, as the most diuretic, is the most useful: much, however, depends on habit; the light wines often act well on the kidneys. "When dropsy appears, associated with a feeble pulse, and other incontestible evidences of languid circulation, the tone of the system is to be supported by wine and brandy,"† and also by suitable tonics.

In scurvy we find wine, and more especially malt liquors, generally recommended; and in the late epidemic which so extensively prevailed in the spring and summer of 1847, we find these liquors used with advantage, and favorably spoken of by the best authorities who have published upon the disease. In the cases reported by Dr. Christison,‡ ale or

* Prout, p. 168.

† Gregory's Elements of Medicine, p. 639.

‡ Journal of Medical Science, vol. viii, p. 1.

porter were regularly prescribed; also by Dr. Lonsdale and others.

In many of the chronic skin diseases, especially in those dependent upon a debilitated condition of the constitution, wine and malt liquors in moderation are recommended by most writers, and found generally useful; as, for instance, in pemphigus, in which "wine or spirits form an admirable adjunct to the tonic treatment."* In fact, stimulants in these cases are employed on the same general principles as in other diseases.

From the review we have now taken of the employment of alcoholic stimuli in the treatment of disease, it is evident, that whatever difference of opinion may exist as to their utility in individual cases, the fact of their general beneficial effect when properly employed, is admitted even by those who advocate the principles of strict abstinence by healthy men. If any are to be the judges of these things, surely it ought to be the members of the medical profession, and therefore medical opinions only have been quoted; and the authority of our highest medical writers has been deemed sufficient to answer the objections of those who deny that alcohol can ever be requisite in the treatment of disease, or who contend that its place could at all times be supplied by some other stimulant.

The action of alcohol in fever, and in atonic dyspepsia, has been more particularly dwelt upon, from the belief that in these two forms of disease, its leading beneficial effects are most easily recognisable by the theories and experiences of

* Wilson on Skin Diseases, p. 180.

rational medicine. In the former we have both its nervo-excitant and chemico-vital effects well displayed and explained, as we find them supplying exactly what is wanted by the exhausted bodily frame; in the latter disease we have, or ought to have (when alcoholic liquor is properly employed), the nervo-excitant effect just exciting a proper amount of vis in the indolent stomach to enable it to digest comfortably aliment sufficient for the ordinary, or in some circumstances extraordinary, wants of the system.

CHAPTER XI.

ALCOHOLIC LIQUORS, TEA, COFFEE, WATER, ETC.

Water—Remarks—Varieties, Soft, Hard, Marsh—Tea and Coffee—Composition, Liebig—Theine, Caffeine—Advantages — Biliary Principles—Chemico-Vital Effects, Stimulant—Green Tea, Effects, Poisonous, Mr. Corfe, Millingen—Black Tea, Dr. Paris—Coffee, Dr. Paris, Dr. A. Combe, Magendie, M. Payen, Dr. Prout—Remarks.

THE question of the use of alcoholic stimuli by man, is so intimately connected, so frequently compared with the employment of other liquids, especially the stimulating beverages tea and coffee, that a treatise of this kind could scarcely be deemed complete without some notice of their comparative effects.

Unquestionably, pure water is the natural drink of man, and to man in a state of nature may be well adapted; but when he begins to experience the benefits, but at the same time the wants and necessary accompaniments of civilization, variety is looked for, and being looked for, it is found in wholesome abundance in milk, in the juice of fruits, in the sap of trees, or the infusions of various vegetable products, which furnish pleasant and wholesome beverages. True, man amid his discoveries, has found out and used many articles of food and drink which are injurious, but this fact does not render the others less wholesome. Man has been blessed with the capability, which more than any other raises him above the mere animal, of becoming a religious being; he has been endowed with intelligence, with reason, and with judgment;

and by the exercise of these he must learn to choose the good and reject the evil, not only in generalities, but as an individual. We know that what will agree and be beneficial to one will prove hurtful to another, and the man who, knowing, feeling, that he is injured thereby, continues the use, even in moderation, of alcoholic liquors, or of some of the less active stimulants, such as tea and coffee, is almost equally culpable with those who habitually use alcohol, opium, or hemp, to produce intoxication. But yet he may err in using water alone, for not only may the requirements of the constitution, especially in civilized man, call for the use of some more nutrient or stimulant beverage, but, like compound drinks, the quality of the water itself which he is compelled to use, may be bad and productive of disease. Probably, in many instances, the quality of the water has been the real cause of man's resorting to the practice of qualifying it by various additions. The arguments which would reduce man to the state of a mere water drinker, are, perhaps, somewhat akin in their origin, to those poetic ideas which have delighted to paint in glowing colours the advantages and virtues of savage life. If man was intended by his Creator to be a mere water drinker, let him by all means return to the simple element, but at the same time to be in conformity, he ought to confine himself to the root, berry, and acorn diet of our ancestors, and exchange his comfortable broadcloth for the natural sheepskin; but if man has been endowed with faculties by means of which he may investigate and reduce to practice, for his own comfort and enjoyment, the varied qualities of those things which make up the sum of the beautiful creation with which he is surrounded, then should it be his duty, gratefully, to use,

without abusing, to enjoy, without exceeding, the gifts of his Maker.

Waters, generally, are divided into hard and soft; the only real soft waters, however, are those distilled artificially, or pure rain or snow water, and these are unpleasant and vapid for drinking. Even the softest spring water contains a small proportion of mineral ingredient, and between the minimum and the maximum we find every gradation of hardness. Soft water is undoubtedly the most wholesome; hard water of course acts upon the system according to the quantity and nature of its saline ingredients.

Without referring to the class of mineral waters, we usually find that hard waters owe their properties to impregnation with lime, either as a sulphate or carbonate. Although our knowledge on the subject is less perfect than we could desire it to be, there can be no doubt that these impregnations are productive of disease: it is tolerably certain that the origin of bronchocele is connected with the presence of lime salts in the water of the districts in which it occurs. Dr. Paris says, "We have known patients after drinking a glass of water, from a sense of weight and oppression at the stomach, at once pronounce the existence of foreign ingredients." Dr. Prout remarks, "with respect to waters, it may be observed, that hard and impure waters possess great influence in urinary diseases and deposits. They operate in various ways, and produce very different effects in different diseases and constitutions; but their general influence in all forms of urinary deposition, is, according to my observations, very unfavorable."* Bad as hard waters may be, those impregnated with

* Stomach and Renal Diseases, p. 210.

decaying matter of any kind are beyond comparison worse. Probably, we have yet to learn the full measure of man's suffering from this cause; but we know that many disorders, especially of the bowels, result from the use of such. It is more than probable, that the above description of water first induced man to infuse in it various vegetable matters, either to correct its disagreeable taste, or like the Chinese, under the idea of correcting the injurious properties, by bitter and astringent vegetable matter.

It would here be out of place to discuss the properties of all the varied drinks, infusions, &c. used by man; we must confine our attention to the effects of those, which being stimulants, but not alcoholic stimulants, are usually contrasted with the latter.

It is probable that there are few more remarkable facts in the records of ethnology, than that which has been brought to light by the recent researches of organic chemistry, respecting the identity of composition of the principles to which tea, coffee, and also cocoa, owe their characteristic properties. On this head, Liebig remarks, "We shall never, certainly, be able to discover how men were led to the use of the hot infusion of the leaves of a certain shrub (tea), or of a decoction of certain roasted seeds (coffee). Some cause there must be, which would explain how the practice has become a necessary of life to whole nations. But it is surely still more remarkable, that the beneficial effects of both plants on the health, must be ascribed to one and the same substance, the presence of which in two vegetables, belonging to different natural families, and the produce of different quarters of the globe, could hardly have presented itself to the boldest imagination. Yet recent

researches have shown, in such a manner as to exclude all doubt, that caffeine, the peculiar principle of coffee, and theine, that of tea, are in all respects identical."* The above facts are the strongest possible argument in favour of the assumption, that man, as he advanced in civilization, required for comfort, and probably also for health, some at least occasional addition to the simple element. What can be more significant of design than this,—that we find in two distinct quarters of the habitable globe, man using, as a daily drink, two distinct forms of vegetable infusion, made, the one from a leaf, the other from a berry, each produced by totally different plants, and yet each exerting nearly the same physiological action upon man: this was calculated to excite admiration, but how much more, when the researches of modern science elucidated the startling fact, that nations in different quarters of the globe, had ignorantly but instinctively been led (we speak now as regards science) to adopt, for the same purpose, these apparently dissimilar materials, which yet owed their characteristic properties to active principles identical in composition: nay, further, that the nations among whom tea and coffee were originally met with, were those whose diet is chiefly vegetable, consequently, who consumed a large quantity of non-azotised matter, at least of matter which did not contain a due proportion of azote for supplying the wants of the healthy system, and especially for furnishing sufficient for the nitrogenized constituents of bile. Nay, science has further pointed out, and Liebig has shown, that from the relation existing between the azotised vegetable principles, theine, caffeine, (and also theobromine,) and the azotised constituents of bile,

* Animal Chemistry, p. 179.

that tea and coffee "are in virtue of their composition, better adapted to this purpose"—to supply the biliary azotised principles—"than all other nitrogenized vegetable principles." It is further singular, that the above is supported by what we might almost call an instinctive habit among many of the poor of our own country who are unable to procure animal—azotised—food, but who will make every effort to procure tea and coffee: the custom is, and is no doubt felt to be, a salutary one, although injury is frequently done by the unnecessarily large quantity of tepid liquid consumed. Indeed, "if we consider the sugar taken with tea as furnishing the carbon of the bile, and the theine its nitrogenized material, whether the bile be formed in the blood or in the liver, we here have its essential constituents."* Tea and coffee, moreover, are particularly adapted for the use of the sedentary, a class peculiar to civilized life: in these persons, the metamorphoses of the tissues being reduced for want of motion, the amount of azotised material available for the formation of bile is diminished. Persons of sedentary habits are also extremely apt to take an excess of non-azotised food. Tea and coffee being capable of furnishing the proper azotised compound, the use of these substances may promote the conversion of that excess into bile, and, accordingly, may favour the combustion of carbonaceous materials, which would otherwise accumulate in the blood, and produce languor, lassitude, and oppression. We have here a chemico-vital effect exerted upon the living system by the active principles of tea and coffee, analogous to, but perfectly distinct from, that exerted by alcohol; we have also to consider the effects of these principles upon the nervous

* Ancell's Review of Liebig. Lancet, 1842-43, p. 729.

system, also different but parallel to those of the spirit. Like alcohol, the first effect of tea and coffee is exerted upon the stomach and its nerves, these effects doubtless being modified by the hot liquid in which they are generally taken. The first effect is stimulant.

Probably, there is no substance not strictly medicinal, which exerts so powerful an influence upon the nervous system, as tea, especially the green variety, of which many persons cannot take even the smallest quantity without experiencing the most disagreeable effects: they become faint; the action of the nervous system is disturbed, the hand trembles, the heart palpitates; sometimes gastric spasm is induced, but more generally a feeling of raking at the stomach, and of extreme hunger shortly after a full meal; lastly, there is extreme wakefulness. "There are some females upon whom green tea produces nearly the same effect as digitalis; and it has been medicinally employed in the diseases for which that herb has so decidedly obtained a high reputation. Desbois, of Rochfort, has by the use of it cured many nervous diseases, which have arisen from accelerated circulation. Dr. Percival had an idea that green tea possessed nearly the same power as does digitalis, of controlling and abating the action of the heart."* In the 'Medical Times,'† there is a most excellent detailed account of the poisonous effects of tea: "It is upon the cerebro-spinal axis that the effects of tea are chiefly manifested. Green tea, especially, is distinguished by this property. It is said that a strong solution of it, applied to the sciatic nerve for half an hour, has caused death. Introduced in only small quantity beneath the abdominal integuments

* Dr. Sigmond, Lancet, 1838-39, vol. ii, p. 785.

† Leading Article, vol. xii, p. 42.

of a frog, it produced complete paralysis of the hind legs lasting for some hours." "Administered as an injection to a dog, it caused a perfect paralysis of the vesical and intestinal sphincters; a partial loss of power in the hind legs, and a total loss in the tail." "A poultice of green tea-leaves, applied over the human stomach, has caused sickness and vomiting—over the abdomen, colicy pains and purging—over the heart, faintness and irregularity of pulsation—over the kidneys, diuresis." Were it requisite here, many more instances of the poisonous effects of this herb might be cited. True, these are chiefly the results of green tea; but in some, black tea will produce nearly similar symptoms. Where individuals have any tendency to dyspeptic affections, they are very apt to be aggravated by the use of tea, which occasions severe gastralgia; these cases are familiar to every medical man; they are frequently cured, solely, by enforcing the disuse of the beverage, which indeed ought to be done in all such cases. Mr. Corfe, in his lectures on the 'Physiognomy of Diseases,'* mentions a case very closely simulating scirrhus of the pylorus, which completely and rapidly recovered as soon as the tea was given up; and in the 'Lancet'† very many cases are recorded to the same effect. The action of tea, in exciting mental phenomena, is equally remarkable with its influence upon the body. Most students are familiar with its power of clearing the mind and facilitating its working; many too have experienced its baneful effect in preventing sleep and occasioning mental irritability. At times, however, the disorder of the faculties of the mind, under the influence of strong tea, amounts nearly to insanity. Millingen says of it,

* Medical Times, June 24th, 1848.

† Lancet, 1832-33, vol. ii.

"In some, it is highly stimulating and exhilarating; in others, its effects are oppression and lowness of spirits; and I have known a person who could never indulge in this beverage, without experiencing a disposition to commit suicide."* Many cases of hypochondriasis are traceable to the inordinate use of tea. Enough has now been said to prove the powerful immediate action exerted by tea upon the constitution and nervous system when taken immoderately, or even in moderation, by people of peculiar idiosyncracy. Generally speaking, however, black tea—green tea ought never to be an article of regular consumption—when taken in moderation, produces effects at once agreeable and beneficial; the gentle stimulation to the stomach certainly assists digestion, especially if the beverage be taken towards the close of the process of chymification, or three or four hours after a full meal. Taken along with food it is at times serviceable; it is thus used by the Tartars to counteract indigestion occasioned by the use of raw flesh. The stimulant properties of tea are not so strongly exhibited when it is taken with a solid meal, as when with a small quantity of light food. When taken in excess at any time, or too soon after a full meal, the warm liquid is apt to debilitate the stomach, and to interfere with the regular progress of digestion. Notwithstanding, however, the evils resulting from the abuse of tea-drinking by some, or its deleterious effects upon a few peculiarly constituted individuals, there can be no doubt "that the salubrity of the infusion to the general mass of the community is established on sufficient testimony to outweigh any argument founded on individual cases."†

* Medical Times, vol. xii, p. 43.

† Dr. Paris, Cyclop. Pract. Med., p. 588.

Many of the remarks respecting tea apply also to coffee; the effects, however, in some respects vary, although the essential active principle of both is identical. Dr. Paris says that coffee is more stimulant than tea, and exerts "a different species of action upon the nervous system," although he at the same time says, "It is very difficult to define the nature of this difference." Dr. Paris further remarks, "If taken immediately after a meal, it is not found to create that disturbance in its digestion which has been noticed as the occasional consequence of tea; on the contrary, it accelerates the operations of the stomach." Dr. Andrew Combe appears to be of the same opinion as regards the power of coffee in aiding digestion, but condemns the practice as the unnecessary use of a stimulant. M. Magendie, on comparing the effects produced by the injection of coffee and brandy into the jugular vein of a dog, found that the former had much more power of accelerating the circulation than the latter. "Coffee has a great influence upon the stomach, and likewise upon the brain. Watchfulness of long duration, with a feverish reaction, are its immediate effects; but its distant ones are more upon the extreme capillary vessels of the surface of the body which it seems to constringe, and it affects the skin to which it gives a peculiar harshness; and it has been said by some of the French writers to give its colour; and the sallowness of the Parisian, has been by more than one medical author, ascribed to the great addiction to coffee."* Coffee is generally considered more nutritious than tea. Probably it is so. At the meeting of the Academy of Sciences, May 4th, 1846, M. Payen endeavoured "to demonstrate that the infusion of coffee contains several azotised principles, in quantity equal at

* Lancet, 1837-38, vol. ii.

least to ten times the amount admitted by Liebig; and that saline and fatty substances of a nutritious nature may be therein detected."* Perhaps we cannot better define the difference between the action of tea and coffee upon the nervous system, than by characterising the former, as the more irritant, the latter, as the more stimulant agent. Dr. Prout ascribes to strong coffee a tendency to produce lithic acid deposits in the predisposed.

With regard to the general influences of tea and coffee on man, on his health and his habits, both social and moral, there can be no question that they have been most beneficial, were it only by their having in great measure supplied the place of alcoholic drinks; still, we have abundant evidence, that these beverages, simple as they may seem in moderate strength and quantity, harmless as they are generally considered, may, in peculiar constitutions, or if taken in excess, give rise to immediate symptoms of poisoning, or lay the foundation of incurable disease.

It appears as if, when men have a stimulant in their power, a certain number of individuals could not use without abusing; and thus, we find in common with other good things, that tea and coffee are not exceptions, either in this country or elsewhere. Inglis says that in Norway, coffee drinking amongst the women, is almost as great a vice as spirit drinking among the men. Norwegian women, of whatever rank, must have their strong coffee at least twice a day. The Chinese literati are said to suffer from the inordinate use of tea. Certainly, many of the same class in our country do so. It has already been remarked, that sedentary people derive benefit from the moderate use of tea and coffee; at the same time, they are the

* Medical Times, May 16, 1846.

most liable to suffer from their immoderate use. The athletic, and those taking much exercise, may indulge more freely; we do not hear of the Australian settlers, whose tea-pot is never off the fire, suffering inconvenience.

It would be difficult to find, for the use of modern civilized man, a substitute, either as regards health or comfort, for the warm tea, or coffee, or cocoa breakfast. The rule is generally admitted, that the system requires that the first morning meal should be a tolerably liquid one; and with most, the less energetic condition of the nervous power in the earlier part of the day, renders it expedient that the liquid should be warm. The experience of every one bears witness to these facts. Even the ancient Greeks found the necessity of some warm beverage for their morning's meal, "and though it does not appear how it was prepared, they had a substitute for tea, in use at Athens, in Eubœa, in Crete, and, no doubt, in all other parts of Greece."* The good effect of a warm fluid breakfast is now generally recognised, and practically acted upon by those having the direction of large bodies of men. Captain Murray† ascribed much of his success, in preserving the health of his ship's crew on notoriously unhealthy stations, to this precaution. Major Forbes‡ says that in Ceylon, "a cup of strong coffee is a sure protection from the effects of morning dews, or the heavy drizzling fogs, which are most prevalent among the Kandian valleys." Coffee and cocoa are generally most suitable for breakfast, as less liable to irritate the stomach and nerves; tea, being lighter, is most suitable for evening.

* G. A. B. St. John's 'Manners of Ancient Greeks,' p. 170.

† See Combe's Constitution of Man.

‡ Eleven Years in Ceylon.

CHAPTER XII.

RECAPITULATION AND CONCLUSIONS.

Subject Divided — Physiological and Therapeutical Question — Proposition — Remarks — Alcoholic Liquors — Proposition extended — Remarks — Cautions, M. Quetelet — Conclusions, Dr. Prout, Mr. G. Combe — Ammonia, not a Substitute, Dr. Huxham, Mr. Ancell — Nourishment — Religious and Moral Question — Scripture Arguments considered — Question of Expediency — Question of Conscience — Conclusion.

THE consideration, in the foregoing chapters of this treatise, of the action of alcoholic stimuli upon the human system, and their employment by man, has been regarded solely as a question of physiology and therapeutics; the subject has, however, become so mixed up with religious, moral, and social considerations and arguments, that it cannot be brought to a conclusion without some notice of these, as well for the sake of completeness, as for the purpose of preventing misunderstanding. Accordingly, it is proposed, after a short review of the bearing of the facts and arguments already adduced, briefly to notice those other considerations to which we have alluded.

At the conclusion of our first chapter, after considering the action of "stimuli generally," the following proposition was adopted: "That the healthy functions, both of body and mind, in man, are dependent for their continuance upon a regular series of ordinary stimulant actions; and further, that these functions are at intervals acted upon by occasional or extraordinary stimulants, which temporarily occasion their exalted and increased action, not only without actual injury, but with

positive benefit; and, lastly, that these extraordinary stimulants are not liable to lose their power of beneficial stimulation, unless exerted in a disorderly and unrestrained manner."

Investigations, such as those which have engaged our attention, involve, in the first place, the consideration of a structure "fearfully and wonderfully made;" the bodily frame of man, which, the more we examine, the more does it excite our wonder and admiration, and our reverence for its Creator. We see this frame fitted to be the earthly mansion for an immortal spiritual being—the instrument, through and by means of which that being maintains communication with the material universe, by means of perfect, varied, and wonderful organizations and functions. Further, we find that these organizations and functions are constituted to act in unison with the media of various kinds by which they are surrounded, and by which they are peculiarly and individually stimulated. We find certain of these stimuli necessary for life and health; we find certain others, if not absolutely necessary for health, beneficial in their action, and only ceasing to be so when improperly employed. The latter were classed as "Occasional stimuli," and amongst them were placed those which form the subject of this essay, "Alcoholic Stimuli." *To these last it is now proposed to extend the proposition considered applicable to the class generally;* for it is thought that the facts and arguments of the preceding pages are sufficient to warrant the conclusion, that *if alcoholic liquors are neither requisite nor desirable as articles of regular use by healthy man under ordinary circumstances, they may, in wholesome forms, and under proper control, be used occasionally with benefit; and further, that in some peculiar states of constitution, in some peculiar con-*

ditions of external relations, and in some modifications of diseased action, they are eminently serviceable.

On what *physiological* grounds the occasional use of unadulterated wine, or other similar fermented stimulant, is to be forbid to man, in his often rare glimpses of social enjoyment, or of relaxation from the cares of life—why these liquors are to be made exceptions, under such circumstances, to the class of occasional stimuli generally, we cannot imagine; for it is certain, that the rousing of the system, the impetus communicated to the functions, which under the many depressing influences of civilized life in great cities are apt to flag, so far from being injurious, is beneficial, and communicates to the system an improved tone, which it does not for some time forget. It is no argument *here* to say that this is a dangerous licence, and that the occasional moderate indulgence is apt to degenerate with some into the habitual intemperance. Argue thus, and there is no one good thing vouchsafed to man in this world that may not be disused because it has been abused. If man will not employ the faculties, the reason bestowed upon him—not obey the revealed command in mercy given him—but will make himself a beast, the abuse of God's good gift is no *real* objection to its use, whatever it may be when considered as a matter of temporary expediency.

With respect to the regular use of alcoholic stimuli by man, not in full health, and yet not actually diseased, there is more room for controversy; the subject has been fully entered into, and the conclusion drawn. That many cases of impaired health do occur, in which the regular use of these excitants is beneficial, principally from their power of increasing nervous activity, more particularly of the stomach, which is thus enabled

to supply the wants of a debilitated system, by the more perfect digestion of a larger proportion of food. But not without due caution should such a use of wine or other stimulant be resorted to, or prescribed. First, let it be ascertained that matters are not to be rectified by the better employment of the *regular natural stimuli*, if possible, before resorting to the artificial; let it be clear that the debility is real, that the system actually stands in need of an additional supply of nervous power, and also of aliment, which the unassisted stomach is unable to provide for it. If the weakness be the result of chronic irritant disease, it is often more likely to be aggravated than relieved by the stimulant; but if this is taken to enable an oppressed stomach to get quit of a load of unnecessary aliment, or to remove the languor consequent upon its insufficient digestion, its effects must be pernicious.

That alcoholic excitants are requisite and advantageous, even to healthy men under peculiar circumstances, has been fully proved. Some of these circumstances are of rare and uncommon occurrence; others are, in some cases, in constant operation. As we have seen, a cold marshy climate may be classed amid the latter. M. Quetelet, in his valuable work 'On Man,' makes the remark, *inter alia*, that cordials, though liable to be abused, are useful in a cold moist climate.*

Lastly, the use of alcoholic stimuli in the treatment of disease can scarcely be controverted, either physiologically or therapeutically, without setting at nought the experience and opinions of those whose authority in medicine deservedly holds the highest place.

In considering that the above conclusions have been legiti-

* Page 78.

mately arrived at, it is never for one moment denied that many and great abuses may and do occur, under the cloak even of these very conclusions; at the same time, it is equally denied that alcoholic stimulant is deserving of the unlimited intemperate abuse lavished upon it by zealots. That alcohol is a poison when improperly employed no one will deny, indeed sufficient proof of this has been given in the present treatise; but if such an argument is to be legitimate against it when properly used, equally legitimate must it be against the employment of tea, coffee, and even at times against water itself. Nay, even some of our most harmless articles of diet are poisons to peculiarly constituted individuals. The pip of an apple will produce urticaria in one, oysters or eggs will do the same in another. The meal of animal food which to-day nourishes, may, to-morrow, in the same person, aggravate febrile excitement; may, in another, produce fatal relapse into disease which the system had almost cast off.

Whether judged by the rules of physiology, therapeutics, or toxicology, alcohol can only be admitted to be a poison when abused. Abuse any, the best gifts of Providence, and either to mind or body they may equally be classed as poison. It has been admitted, that when abused, alcohol is a poison; not necessarily a quick one; it may do its slow work month by month, year by year, if the abuse be continued, till at last it kills. But even if the abuse be discontinued, the seeds of disease may have been sown, to lie dormant, it may be, during the prime and vigour of manhood, and only to be developed with, and add distress to, the failing powers of the evening of life. To use the expressive words of Dr. Prout:—"The gay and thoughtless little think of the consequences of their dissi-

pation, and that they are, in fact, to use a mercantile simile, drawing bills at twenty which will certainly be demanded at some future period of their lives with fearful interest." At the time, even, men are often indirectly sufferers from intemperance in ways they least expect. "When men fall from houses, scaffolds, or slip on the street, how frequently should we find their muscular, nervous, and mental energies impaired by preceding debaucheries."* Before concluding the present portion of our chapter, it is requisite to notice two remaining arguments adduced by those who contend for the abandonment of alcoholic liquors in every form and for every purpose. The first of these is, that when stimuli are required, ammonia will serve every purpose that can be fulfilled by alcohol. It is scarcely necessary, after the explanations already given of the chemico-vital effects of the latter excitant upon the system, and the indications these effects fulfil in the treatment of disease, to enter far into this subject; any one who has considered the reasons given for the employment of alcohol, must clearly see, even if other minor considerations were wanting, that it is perfectly impossible for the same ends to be fulfilled by ammonia—the chemical constitution of the alkali renders it so. But even were it not so, ammonia, used in excess, or even moderately in some cases, especially of fever, in which alcohol is most beneficial, is a real poison, and very pernicious in its influence. Dr. Huxham has related the case of a gentleman who accustomed himself to take ammonia in great excess, the consequence was "fever, profuse hemorrhage from the intestines, nose, and gums; every one of his teeth dropped out;" other severe symptoms became manifested, and although

* Combe's Constitution of Man.

the habit was left off, he died in a state of marasmus. "Huxham compared these effects to those which result from the bite of a viper; he attributed them to the blood being dissolved; and he asserted, I should say truly, that volatile alkali taken in excess, even by persons in health, produces symptoms which indicate a beginning dissolution and putridity of the blood."

Mr. Ancell, from whose 'Lectures on the Blood' the above extract is taken, says of ammonia—"if absorbed into the blood in the low stage of some fevers, it is death. I believe that I have seen patients rapidly succumb under the free use of ammonia in such cases; and I should say, both from theory and observation, that to fulfil the indications there required, *it is the worst stimulant that can be selected.*"*

The effects of ammonia just recorded, are perfectly in accordance with the experience generally of medical practitioners, especially as regards the alkali in its states of combination used in medicine; and, probably, sufficient evidence has now been adduced, to convince every unbiassed mind, that however valuable the two stimuli—alcohol and ammonia—may be in their respective places, they cannot possibly fulfil the same indications, or be substituted one for the other.

The other remaining argument is, that alcohol and alcoholic liquors generally, are useless because they possess no power of nourishing the body. No one who understands the subject of the action of these liquors upon the system, will for one moment contend that, as actually affording direct nourishment —that is, pabulum for the bodily tissues—they can be of any avail. That in certain cases, however, they do nourish indi-

* Lancet, 1839-40, vol. ii, p. 922.

rectly, by enabling a debilitated atonic stomach properly to digest its food, has been already proved; and further, it has been no less clearly demonstrated, that in disease, especially, they are also indirectly nutrient, by furnishing respiratory material, and thus protecting the tissues from waste. Similar action, doubtless, takes place under other circumstances, and is probably the reason why consumers of malt liquor have so great a tendency to become corpulent. The liquor, besides affording some degree of direct nourishment, facilitates rather than interferes with the digestion of the food, whilst the spirit, by affording respiratory aliment, protects the tissues from waste.

The question of the employment of alcoholic liquors by man, when considered either in a religious, moral, or social point of view, necessarily becomes subject to arguments and conclusions very different to those which affected it in its physiological or therapeutical bearing. Could it be proved that in all forms of combination, under all circumstances, alcohol is positively injurious to the human system, there would be an end of the subject; no argument could justify its use; but that it is not always injurious, nay, that it is often really serviceable, has, we consider, been fully proved, and the circumstances under which it is thus serviceable, as well as those in which it is unnecessary and hurtful, have been demonstrated and confirmed. So far, then, the question is but one of right or wrong, according to circumstances, with latitude enough about it, moreover, to render it one of expediency also; such it becomes in the point of view in which we now have to consider it.

It has been said, that could full proof be given of alcohol

always proving injurious to the human system, the question would be at an end; it may be said, further, that the same must be the case, did revealed Scripture furnish us with any testimony that the *use* of fluids containing alcohol was forbid by God. There is no intention here of calling in the aid of the Bible in the way it is often done, and of insisting that all the wines mentioned therein were alcoholic wines similar to those drank at the present day. The question is one on which much controversy, a good deal of philology, and some amount of intemperate language have been expended, and, after all, it is in many points doubtful. It has been pointed out in a previous chapter, that what were called wines by the ancients, were drinks of very varied properties; some, not being fermented, contained no alcohol at all; others were drugged, and many being really fermented, contained spirit, but not to the extent that the strong wines of the present day do, which have their strength artificially and injuriously increased, by the addition of free alcohol. That these drugged or alcoholic wines were not only used, but liable to be abused in those days, as now, may be gathered from the warnings and denunciations against that abuse given in the sacred writings; but, that anywhere, the employment of naturally fermented wine is forbidden, cannot be proved; certainly, the condemnation of the perversion of God's good gifts, cannot be assumed as a command against their legitimate and properly regulated application. In making, then, as is too frequently done, the abstinence from all fermented liquor a "shibboleth" in a Christian community, is, to say the least, a transgression of the law of Christian charity, and an assumption of power not quite consistent with Christian liberty. If anywhere we might expect to find alcoholic stimuli

absolutely forbidden, it would be in hot climates, in which, more than elsewhere, they are likely to be injurious; but our Creator, cognizant of our meanest wants, more liberal to the requirements of man than man is inclined to be to his fellows, does not in his Word, destined to traverse and bless every quarter of the globe,

> "From Greenland's icy mountains,
> To India's coral strand,"

destined to guide the simple healthy peasant, as well as the overtoiled debilitated dweller in the large city, He does not issue laws to regulate those minor details of man's everyday life, which are modified by, and modify his habits and customs, according to circumstances and situations. The question then simply asks—Has the moderate use of alcoholic liquor, in all forms, and under all circumstances, been forbid in the Bible? Believing it has not, we contend that in the moderate use no man has a right to judge his fellows from the Bible. When a man abuses alcoholic stimuli, as when he abuses any other gift of his Creator, he then lays himself open to judgment, and must abide thereby.

On the other hand, the advocates for the regular free use of alcoholic liquors, cannot find support to their cause in the Sacred Book, for even were it probable that every time wine is alluded to, it meant a fermented alcoholic wine, it could not possibly be one, the strength of which had been artificially increased by the addition of free alcohol, then unknown: neither can they find countenance for the use of ardent spirit, which ought to be confined to the list of the materia medica. Both parties are in the same dilemma, and have only to thank themselves; for by making a physiological and therapeutical question

—the use, not the abuse, is now alluded to—a theological one, they have taken it out of its proper position.

In regarding the propriety of men generally using or disusing alcoholic liquors, the case becomes abundantly altered, if it is considered with respect to its social and moral bearings, and as a case of expediency. The good resulting from the Temperance and Total-Abstinence Movements has been beyond calculation, and must have met the approbation of every man desirous of furthering the temporal and eternal welfare of his fellow creatures. All honour be to the zealous and good promoters of the cause: it has rescued many an individual, many a family from misery and destitution here, perhaps from perdition hereafter; but yet, look at the question as you will, it is but one of present though of great expediency. Nothing can be more unjust to the philanthropic promoters of Total Abstinence, than to accuse them of wishing to substitute their doctrine for the religion of the Bible; still, however, their system is only adapted, and it is eminently so, for men sunk in a sensual state, incapable of exerting the higher control of religion, or even of rational intelligence; and it is in this view that the pledge of total abstinence assumes its most valuable aspect. We find a large mass, a large proportion of men, who cannot use without abusing, who are unable to control their own actions; with such, the pledge, the vow, is the only means of restraint, and for this purpose it is most valuable, and every man who is not merely habitually intemperate, but who even verges towards the dangerous boundary, ought to become a total abstainer; we would even say, at the risk of some injury to health. Beyond this, the question becomes one of private judgment: if any man, capable of governing himself as a responsible being, yet feels,

that all circumstances considered, he ought to become a pledged total abstainer for the sake of example, and that his physical constitution and external relations admit of it without injury to his efficiency in his individual duties, let him do so by all means: the question is one of duty to his Maker, to his neighbour, and to himself; but let him beware of judging his brother, who does not think, who is physically unfit to act along with him. "One believeth that he may eat all things: another, who is weak, eateth herbs. Let not him that eateth despise him that eateth not; and let not him which eateth not, judge him that eateth." But let no man pledge himself against the use of alcohol in disease; to do so is both dangerous and unwarrantable, and those who either adopt or require such a promise, only display ignorance or blind enthusiasm. A good cause does not require exaggerated statements or wild assertions; they may gain over ignorant or excitable individuals, who are guided by their feelings rather than by their judgment; but they will not convince, or win the assent of the mass of the intelligent and educated, whose support is most to be prized. We cannot conclude this treatise more fitly than in the words of an undoubted advocate of temperance:

Dr. Carpenter* says of the disciples of total abstinence: "Too often their intemperance has passed from their cups to their language; the finger of pharisaical scorn has been pointed at 'moderate drinkers,' whose consciences have not yet told them that there is any harm in the temperate use of fermented liquors; and even those who agree with them in their leading principles, and who join with them in their practice, but who

* Temperance and Teetotalism, p. 11.

hesitate at sanctioning all that ignorant enthusiasts think fit to assert, have been stigmatised as enemies rather than as friends to the great cause of emancipation. Now, we must fully recognise the importance of earnest and awakening appeals to those who are sunk in the lethargic slavery of one of the most brutalizing of all sensual indulgences; but we are certain that exaggeration never ultimately serves the interests of truth. No words *can* depict too strongly the evils of intemperance; no appeals *can* be too urgent or awakening to the blunted feelings of those who are ruining themselves, both for time and eternity, by a habitual indulgence in this overpowering propensity; but surely there is plenty matter for the advocates of abstinence, without going out of their way to condemn those who maintain that fermented liquors are the gifts of God, to be *used* in moderation, but not *abused*. We are quite sure that the manner in which their public proceedings have been conducted has kept many aloof who would have been most valuable and influential advocates of this great cause of social and individual reformation. The fact, we believe to be, that a large proportion of the intemperate denunciations and rash statements to which we allude, have been put forth by men who have themselves felt all the tyranny of this dreadful slavery, and (as we have been informed by some most competent observers) they feel, on their emancipation from it, a sort of excitement that is almost uncontrollable, urging them to bear public testimony to the evils from which they have escaped, and infusing into that testimony a strength that makes it operate powerfully on the minds of those whom they desire to awaken; whilst it leads them (with the want

of discrimination natural to men of imperfect education) to express the most unmitigated reprobation of those more especially who profess themselves friends of temperance, but who do not feel called upon to preach or to practise total abstinence."

FINIS.

PRINTED BY C. AND J. ADLARD,
BARTHOLOMEW CLOSE.